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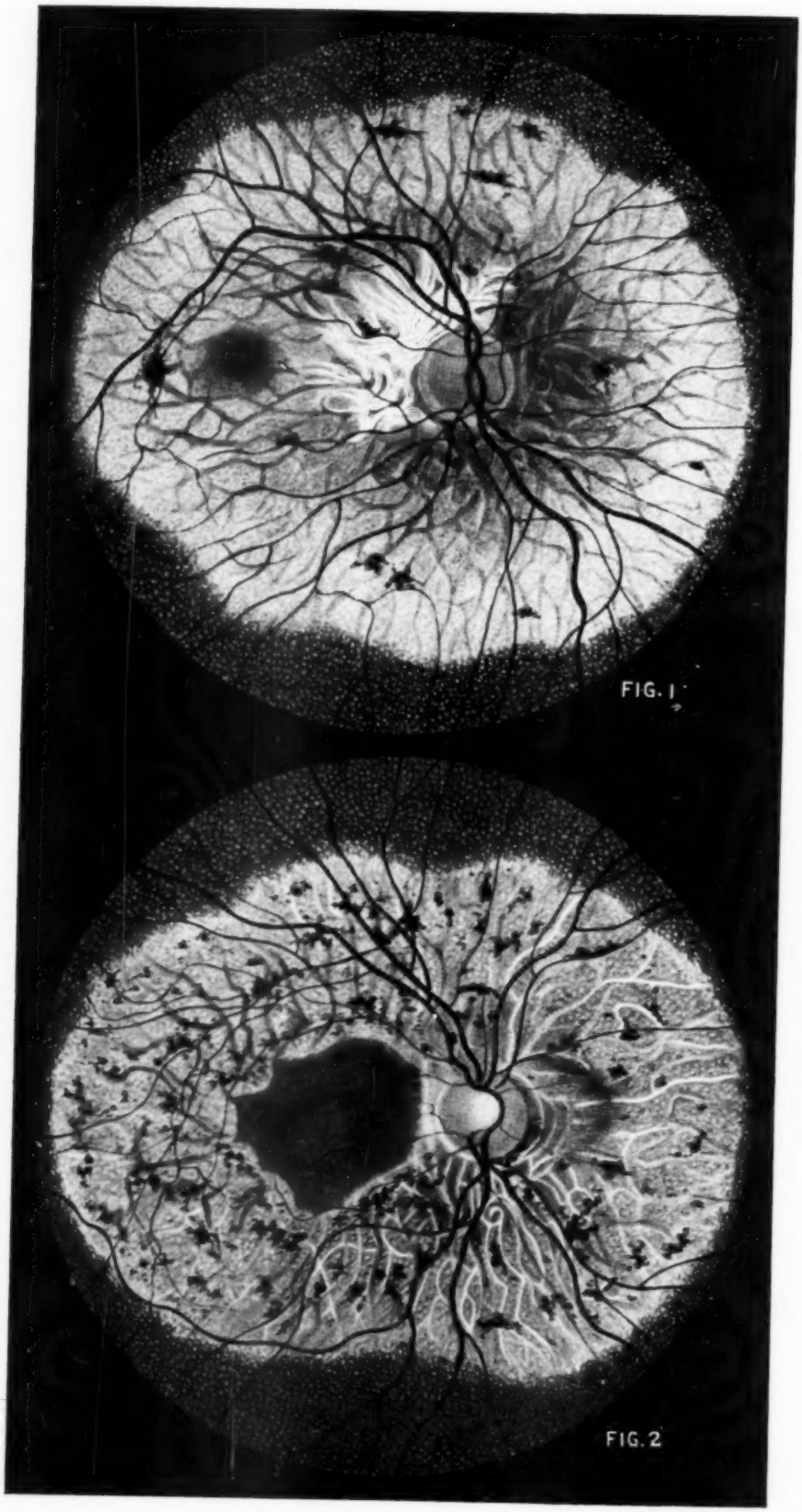

TAPETORETINAL DEGENERATION OF CENTRAL FUNDUS REGION (ARNOLD PILLAT).

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TAPETORETINAL DEGENERATION OF THE CENTRAL FUNDUS REGION

A combination of retinitis pigmentosa centralis and retinitis punctata albescens

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The two cases here described, and illustrated in the color plate which forms the frontispiece to this issue of the American Journal of Ophthalmology, presented ophthalmoscopically the characteristics of a true retinitis pigmentosa including choroidal sclerosis, atrophy of the pigment epithelium, and migration of pigment; and at the same time a retinitis punctata albescens which involved the periphery of the retina as well as the central zone of retinitis pigmentosa. One case showed a central scotoma, and the other a ring scotoma. One case had no concentric contraction of the visual field, and the other case only moderate contraction. The literature of the subject is carefully reviewed. From the department of ophthalmology of the Peiping Union medical college, Peiping, China.

Typical retinitis pigmentosa is a disease of the periphery of the retina, or, as particularly emphasized by Gonin[1] and Koellner[2], a disease of the equatorial parts of the eyeground, whence it gradually extends both to the periphery and toward the center. The foveal region often remains free from pigment changes or after many years shows either such changes as continuation of the pigmentation from the periphery, or the substitution of a white or whitish-grey mass of connective tissue, which is often prominent toward the vitreous body. These central changes are usually preceded by honeycomb degeneration of the macula lutea (Vogt), which is best visible with red-free light.

We do not, however know very much about those forms of retinitis pigmentosa, which contrary to the usual form, are situated in the central part of the eyeground and leave the periphery free.

In the literature "familial choroiditis" (Doyne[3]), atrophia choroideæ and retinæ gyrata, heredodegeneration of the macula (Stargardt[4], Best[5]), choroiditis guttata, and other central lesions are usually considered as a tapetoretinal degeneration of the region of macula and papilla (Leber[6]). There are certain anatomical and clinical analogies between all the diseases just mentioned and between real "central pigmentary degeneration of the retina" or "central retinitis pigmentosa", such as atrophy of the choriocapillary layer in some cases and migration of pigment from the pigment epithelium into the retina. In addition, there is early disturbance of central vision, the presence of a central scotoma instead of a peripheral contraction of the visual field, and absence of hemeralopia.

From the clinical and especially the ophthalmoscopic point of view however, we are justified in distinguishing sharply between central retinitis pigmentosa and other forms of degeneration of the macula, as the two following cases, which are in every respect cases of typical central retinitis pigmentosa, quite different from the other macular diseases will show. On the other hand, the existence of certain transitional forms between the different groups should not be cited.

In the literature I find only a very few cases which belong to the type of real central retinitis pigmentosa and which are similar to mine.

H. Knapp[7], 1870, describes the fundus of a woman, thirty-five years old, in which "the region of the yellow spot and its surroundings are whitish opaque, studded with the characteristic

bone corpuscle-like pigment spots. Throughout the whole retina except in the outer upper quadrant, white diffuse specks were seen scattered among the black ones." In the brief description he gives it is not clear whether he means "normal pigmentation" in the periphery, as mentioned in the beginning of his description, or pathologic pigmentation. It is most probable that he means the first named type as his case showed no concentric contraction of the visual field, but a large central scotoma, with central vision of finger counting at 1.20 meters. Eccentric vision was good, but is not stated in figures. The patient could not see red, but recognized the other colors. It would seem that Knapp's case was also one of central retinitis pigmentosa with retinitis punctata albescens, which at that time was not yet recognized as such.

In 1908 Kapuscinski[8] reported from Axenfeld's clinic the case of a woman, fifty-two years old, in whom there was retinitis pigmentosa without hemeralopia. In that case the pigmented zone was found all around the macula; the fovea itself and also the periphery were quite free from pigment changes. There was no concentric contraction of the visual field, but only a large ring scotoma with good central vision (R. 7/25, L. 7/10). There was no hemeralopia. Two cases by Axenfeld and Mans reported briefly in the same paper, seem to be similar, but in none of the cases is retinitis punctata albescens mentioned.

Wittmer[9] and Lafon[10] have described two cases which I consider similar to mine. Wittmer[9] found in a forty-five year old woman a ring-shaped retinitis pigmentosa, with typical ring scotoma and normal central vision (6/6). The pigment zone was one disc diameter in diameter, surrounding the papillomacular region. In Lafon's[10] case there was, besides the pigmented ring zone (from ten to twenty degrees), a whitish stippling all around. The macula lutea was normal. Vision was 6/6 o.u. Besides a ring scotoma there was peripheral contraction of the visual field from the nasal side. Color sense was normal. There was no consanguinity. The patient was suffering from a recently acquired syphilis.

It is most probable that the first three cases mentioned by Scheerer[11] also belong to this group, but in all his cases there is, besides the ring-shaped pigmentation around the fovea and the corresponding ring or half-ring scotoma, a pigmentation at least in one quadrant of the eyeground periphery. These cases probably represent transitional forms of central and peripheral retinitis pigmentosa, or are cases in which peripheral pigmentation extends in a peculiar way in one particular fundus area toward the center, while not affecting the rest of the fundus.

The cases of two brothers reported by Germaix[2], I do not consider to represent central retinitis pigmentosa as does Leber[6] in his book. The case of Maewsky[13], according to his description, also does not belong exactly to our group. The case described by Pöllot[14] as "atypical chorioretinitis pigmentosa hereditaria" is only a typical case of retinitis pigmentosa with severe changes in the macula.

The cases of Batten[15], Nettleship[16], Mayou[17], Doyne[3], Stargardt[4], Rieger[18], Halbertsma[19], Morelli[20], and others reported under various titles belong to the group of heredodegeneration or familial progressive degeneration of the macular region (Stargardt), and not strictly to typical central retinitis pigmentosa. (For literature on this whole question, up to 1914, see Leber's "The diseases of the retina", 1916, volume 2.)

It is well known that in some cases of retinitis punctata albescens, which may belong to the same group as ours, pigmentation of the periphery as well as changes of the macula occur. A recent example of retinitis punctata albescens, with black pigment spots in the periphery, concentric contraction of the visual field, and central scotoma for colors (color-blindness?) is the case reported by Trettenero[21] in a woman of twenty years.

The classifying of Derkac's[22] case in

a woman of twenty-five years, with a black spot in both maculas and retinitis punctata albescens all around, as belonging to typical central retinitis pigmentosa appear to me questionable. The case reported by Oeller[23] (plate 20 in the "Atlas of rare ophthalmologic conditions") in a nineteen year old woman, with a half-ring scotoma near the fixation point and with vision of 1/20 in each eye, considered by him as a combination of retinitis pigmentosa and retinitis punctata albescens, is at least doubtful, from the picture he gives. Oeller himself realizes the difference of his case from the description given by E. Fuchs[24] of typical cases of retinitis punctata albescens.

In view of the small number of cases reported in the literature, the following report of two cases in Chinamen, typical in my opinion of retinitis pigmentosa centralis combined with retinitis punctata albescens, may be of interest.

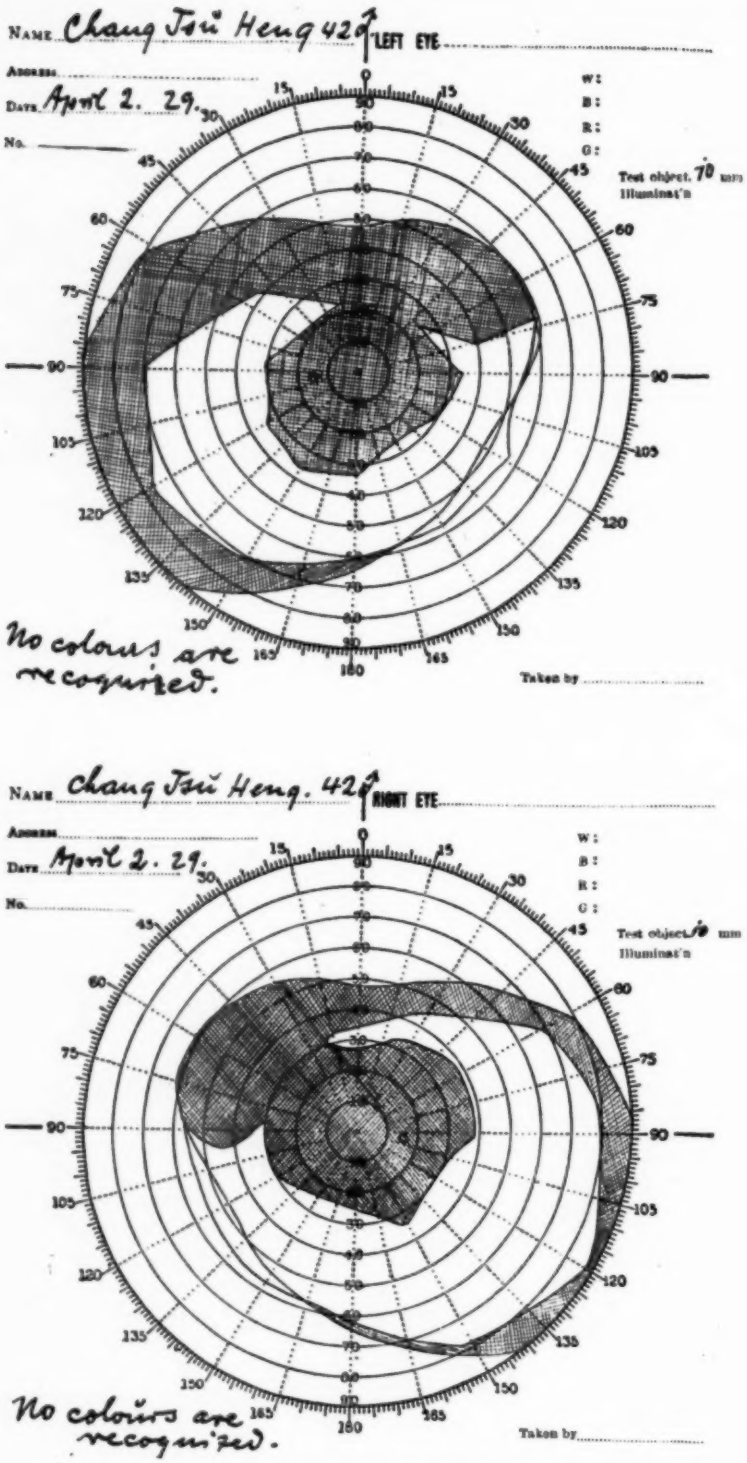
Case 1

A male teacher, Chang Tsu Heng, forty-two years old (hospital no. 23724/1929) came to our eye clinic on account of impairment of near vision. He claimed to have been shortsighted since eight years of age, but had been able to read easily until his fifteenth year. Studying at the university he noticed that his shortsightedness was not like that of other people and that even with glasses he could not read what was written on the blackboard. Between thirty and forty years of age, his visual acuity became still worse. At the same time his hearing began to decrease. He was treated for several years by a Chinese quack, who among other things excised a piece of the bulbar conjunctiva of the left eye. He afterward consulted three western-trained physicians, and at last came to our hospital because nothing had helped him. He had scarlatina at the age of four, typhus at twenty, gonorrhea at twenty-five years. He was married at the age of twenty-one years and had seven children: the first, a son, died on forceps delivery; the second, a son, died of scarlatina at seven years; the third, a daughter, died of diarrhea at six months; and the fourth, a son, died of scarlatina when four months old. Three sons, six, ten, and twelve years of age, were living and enjoying good vision. Examination of these children was not possible on account of the great distance from their home. The wife of the patient, hard of hearing since her thirtieth year, had normal vision. His father, seventy-eight years old, had also good vision, but his mother, sixty-two years old, had not seen big things like cups for many years and helped herself by touching everything with her hands. One of the two brothers of the patient, thirty years old, had the same trouble as the patient himself.

Findings, April 2, 1929: External examination was negative, except for a few peripheral corneal maculas in each eye resulting from phlyctenular keratitis. The irides were dark brown, the pupils became fully dilated by atropin, the lenses were normal.

Vitreous body: In each eye there was a ring-shaped opacity far in front of the disc, now white now dark, which appeared to be a little displaced nasally to the disc. The temporal contour line was clearly visible by direct image in every direction, but the nasal only by turning the mirror in a certain direction. These ring opacities, in the right eye 19 D., in the left eye 16 D. in front of the level of the fundus, were easily seen with the ophthalmoscope by indirect image. In the direct image, these rings showed oscillations when the eyes were moved, but they always came back to their original position. They were not vitreous opacities of inflammatory origin, but were merely the ring-shaped rupture of a posterior detachment of the vitreous body (Pillat[25]). With the help of the slit-lamp some fine brown linear vitreous opacities were seen attached to the vitreous net work. About one lens diameter behind the lens, just recognizable with the slit-lamp, lay a dense white opacity which was probably identical with the ring seen with the ophthalmoscope.

The two fundi were so similar in every detail that the description of one



VISUAL FIELD CHART 1

Case 1. 42 years of age; retinitis pigmentosa centralis and retinitis punctata albescens o.u.; central scotoma and peripheral contraction.

can be taken for both. The disc was somewhat vaguely defined, a homogeneous yellowish-red. The veins and arteries were almost equally thick, somewhat narrower than normal, and their color was almost equal. In the center of the disc the vessels were blurred by glial tissue.

The diseased zone extended nasally, above and below the disc, three disc diameters into the fundus, temporally four disc diameters (see color plate, figure 1). Within this zone the choroidal vessels were clearly visible and severely sclerosed. Their color was white next to the disc, light yellow or yellowish-red a little farther away, and the vessels were covered in the periphery of the diseased zone by a gray, stippled film. The periphery of the eyeground was of the type of the homogeneous red fundus without visible choroidal vessels.

The intervascular pigment layer of the choroid partly covered the choroidal vessels so that here and there the contour lines looked dentate. Next to the disc the choriocapillary layer appeared to be absent.

The pigment epithelial layer also appeared to be absent over an area of almost one disc diameter around the disc. Outward from this area the fundus showed with the electric ophthalmoscope, in direct image, a marked white stippling which in some places glistened, and which within the diseased zone were definitely contrasted with the dark pigment of the choroid. The individual dots, looking like glistening reflexes in the vicinity of the disc, became larger and dimmer the farther away from the disc they were, and in some places they reached the diameter of veins of the primary order. Outside the diseased zone the white spots still increased a little in number and size, and added a slight gray hue to the red color of the fundus all the way to the extreme periphery. All these grey specks, which were almost equal in size, lay far behind the retinal vessels, but they appeared to lie in front of the choroid. In the peripheral part of the diseased central zone there were some bone-corpuscle-shaped or quite irregularly branched black pigment clumps, overlying the retinal vessels, where these were present. At only one place in the fundus periphery (temporally and upward) was there one black spot among the white stipplings.

The retina seemed more blurred in the periphery than in the center, where the choroidal vessels seemed to lie almost free. In the center of the fovea was a dark reddish brown, roundish spot with irregular contour lines, almost 0.75 disc diameter in size. In its neighborhood were a few dark pigmented spots. In red-free light the macullutea appeared to be enlarged and to be divided up into separate areas by white lines. In circumscribed areas the yellow was almost absent—honeycomb macula of Vogt. In the left eye the macula had the shape of a blunt arrow, with the point directed toward the disc.

The tension was normal in both eyes.

Vision: R. 2/60 with—5.5—1 cyl. 90° =6/10; Jaeger 9. L. 2/60 with—5.5—1.5 cyl. 90°=6/15; Jaeger 11.

The visual field of each eye showed concentric contraction for white temporally and upward, and a big central scotoma over an extent of 20 to 25 degrees, which was in connection with the periphery in the upper half (see visual field chart 1).

Color sense: The patient was totally color-blind.

Light sense: 1/9 with five-point adaptometer (Birch-Hirschfeld).

Comments on case 1

We are dealing, in this forty-two year-old-patient, with tapetoretinal degeneration of both eyes, which has probably existed since childhood. In the periphery it shows the picture of retinitis punctata albescens, but in the central parts of the eyeground a true retinitis pigmentosa centralis. The retinitis pigmentosa is sharply limited toward the rest of the fundus, while the white-grey spots of the retinitis punctata albescens reach into the zone of retinitis pigmentosa and disappear just before they reach the disc. The pigment spots are not very numerous. Vis-

ion for distance is with correction R. 6/10, L. 6/15; vision for near, corresponding to the central lesions of the eyeground, is only Jaeger 9 and 11 respectively, and then with difficulty. The patient shows a central scotoma, which is related to a moderate concentric contraction, and he is color-blind. The vitreous body is diseased in its posterior part. The heredity of the disease is shown by the same disease having been present probably in the patient's mother and in his elder brother. There is no history of consanguinity in the family.

Case 2

A clerk, fifty-one years of age (hospital no. 23722) came to the clinic with a complaint of impairment of vision of nearly two years duration. He had never had any eye disease, but since he was twelve years old he had not been able to see in the dark so well as others. His parents were dead, three brothers were living, and a sister had died of tuberculosis. The patient had two children, a son and a daughter. All members of his family were supposed to have good vision. There was no consanguinity in the family. As all the relatives of the patient were living in Shantung, examination of the other members of the family was impossible.

Findings, April 4, 1929: Both eyes were normal externally, the irides brown, the pupil could only be semidilated with homatropin. The lenses were normal.

The two fundi of both eyes were almost like mirror images, so that a report of the right eye suffices.

The vitreous was clear; no changes were visible even under the slit-lamp.

The disc was normal, with sharp outlines and a small cupping in the center. Its nasal margin was overlapped by dotted fundus pigment. The veins and arteries had almost the same color and equal caliber.

The diseased zone of the fundus occupied the central part, extending nasally from the disc four disc diameters, upward and downward three disc diameters, and temporally about five to six disc diameters (see color plate, figure 2). The fovea and a small area between the fovea and the disc showed no changes.

Within the diseased zone the choroidal vessels showed the most severe changes: sclerosis in all degrees from light red to white in color. In the intervascular spaces the grayish choroidal pigment was visible and in some places overlapped the altered choroidal vessels. It is obvious that the choriocapillary layer must have disappeared completely; otherwise the vascular structure could not be so clearly visible. The outlines of the diseased zone toward the normal fundus were rather sharp.

Besides the choriocapillary layer, the pigment epithelium layer of the retina also must have been destroyed in the central area. The pigment had clumped together and in many places it overlapped the retinal vessels. The color of the irregularly shaped pigment spots varied from a deep black to a light grey.

Throughout the periphery of the fundus was visible a grey stippling, which lay behind the retinal vessels, and was quite similar to that in case 1. In the diseased central zone this stippling was most clearly visible in the periphery, but around the disc it was not so marked. The red field in the center of the fundus showed faint stippling only.

The retina, seen in indirect light, was slightly gray throughout the whole fundus, and in the diseased zone it showed many reflexes coming from the inner surface. The vessels, however, were clearly visible right to the extreme periphery. With the help of red-free light white stripes were seen along the blood vessels, as an indication of the change in the vessel wall.

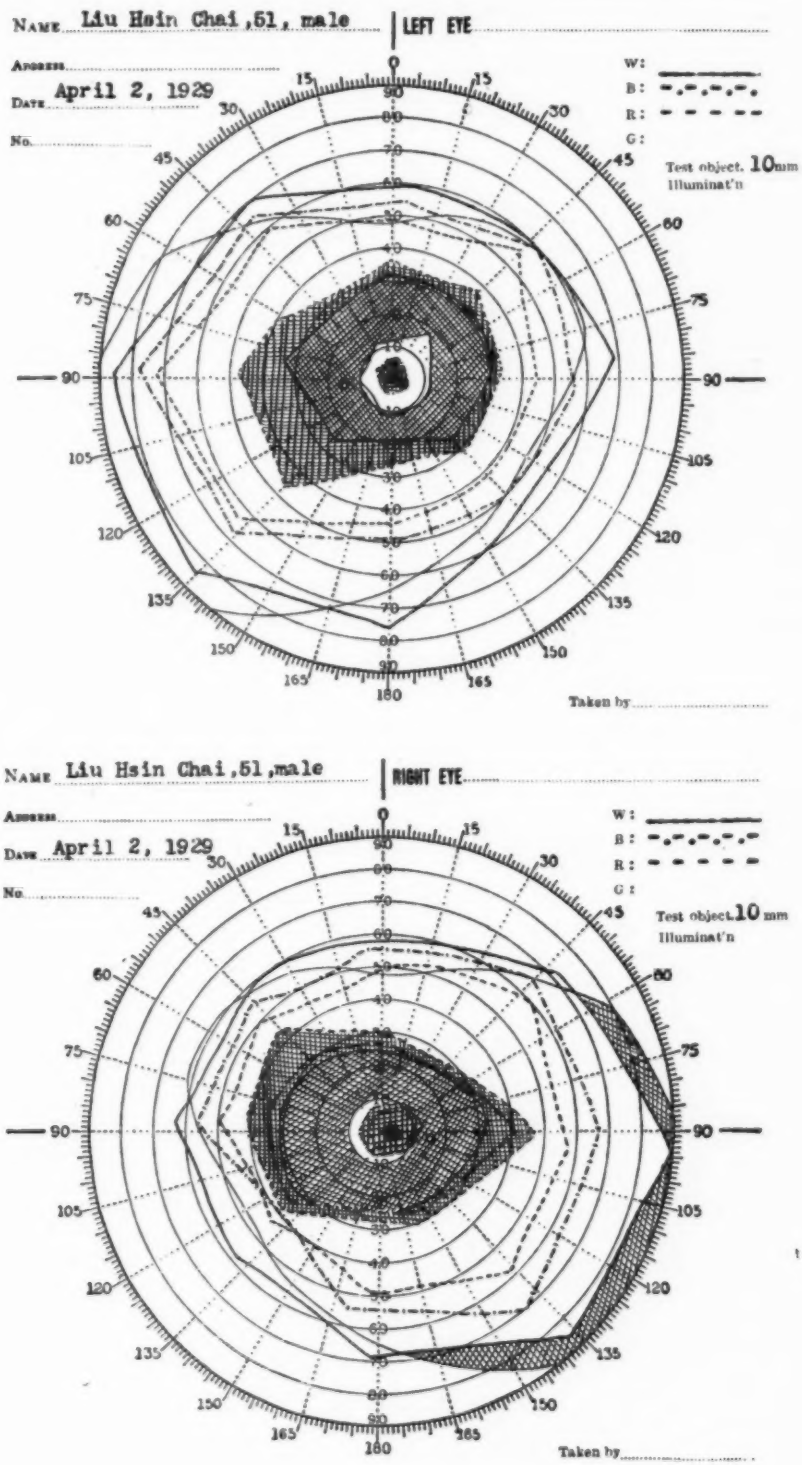
The zone of the yellow color in the macula was remarkably enlarged and consisted of yellow areas separated by black lines. Many glistening reflexes overlapped the yellow zone.

Vision: R. E. 6/30, L. E. 6/60, 6/36?; unimproved by plus or minus glasses; Jaeger 4.

Adaptation: 1/36 (five point adaptometer of Birch-Hirschfeld).

Tension: normal in each eye.

Visual field: The outlines for test ob-



VISUAL FIELD CHART 2

Case 2. 51 years of age; retinitis pigmentosa centralis and retinitis punctata albescens o.u.; ring-scotoma and small central scotoma for white and colors. The outlines of the visual field are normal.

jects ten millimeters square of white and red were normal; blue was only recognized with a test object twenty millimeters square. There was a beginning ring scotoma for white and all colors and besides this a central scotoma, minute for white and about five degrees for color (see visual field chart 2).

Medical examinations were negative, as was also the Wassermann blood reaction.

Comments on case 2

We are dealing here with a tapetoretinal degeneration in a patient fifty-one years old, which shows, as does case 1, a combination of a retinitis punctata albescens with a ring-shaped type of central retinitis pigmentosa. The gray stippling is visible almost all through the fundus. By examination with ordinary electric light the foveal region seems normal; in red-free light the macula shows a beginning degeneration, which fact is consistent with the central scotoma and the reading of Jaeger 4. The light sense is much reduced, and the visual field shows, in accordance with the fundus changes, a large ring-shaped scotoma. The patient is not color-blind, but blue is only recognized when the test object is 20 mm. square. The vision is reduced to 6/60.

Unfortunately, it is not possible to examine other members of the family. The negative family history of the patient is of no great importance, but there is no consanguinity.

As the two pictures and the description show, both cases represent the combination of a typical retinitis punctata albescens with a central retinitis pigmentosa; which latter from the ophthalmoscopic point of view in reality differs from the other forms of degeneration of the foveal region such as "heredodegeneration with or without dementia" (Stargardt), or Batten's classification of "degenerative macular diseases" and "cerebromacular degeneration". In our two cases the typical picture of retinitis pigmentosa is present, but only in the center of the fundus, while the fundus periphery is free.

The following symptoms are remarkable and are equal in both cases:

1. The outlines of the zone of retinitis pigmentosa are rather sharp. The gray fundus color stops in a sharp, arched line. In case 2 the inner limitation of the ring is less sharp towards the fovea. The pigment spots are bone-corpuscle-shaped, moderate in number, and most of them are in front of the vessels of the retina.

2. The sclerosis of the choroidal vessels in the diseased central part is very marked. The choriocapillary layer seems to have disappeared at least in the neighborhood of the disc.

3. The fovea centralis is involved in both cases. In case 1 there is a red-brown irregular spot, 0.75 disc diameter in size, which appears in red-free light to be at the center of the fovea, where the yellow color is somewhat faded, enlarged, and divided up by whitish lines into separate areas. In case 2, where under ordinary ophthalmoscopic examination the macula seems to be normal, the yellow color appears in red-free light to be divided by blackish lines into separate areas with many glistening reflexes. In both cases this is the "honeycomb macula" of Vogt.

4. The discs in both cases are somewhat yellow-red, but fairly sharply outlined and normal. The retinal veins and arteries are a little thinner and show less difference of color and caliber than normal.

5. In both cases the retinitis punctata albescens occupies the whole fundus from the extreme periphery to the foveal region. Only in the fovea itself and in a zone of one disc diameter around the disc, where the sclerosis of choroidal vessels is best seen, no albescens dots are found. These dots are almost uniform in size (one vein-diameter), in color (white-grey) and in shape (round) and are so close together that the whole color of the fundus acquires a grey-red tint from them. In the extreme periphery the choroidal structure is visible through them. In the peripheral zone of central retinitis pigmen-

tosa the albescens dots are as numerous and as large as outside this zone, but toward the center they become smaller in size, with many glistening reflexes in front of them, showing that the inner surface of the retina becomes uneven. The foveal region is free from these spots.

Because of their entirely different appearance I cannot agree with Leber's opinion that these white dots are drusen of the lamina vitrea. Drusen are more sharply defined, yellower in color, and in marked cases are irregularly scattered through the fundus. In addition to the diagnostic points which Nettleship (1908) gives for the albescens spots, such as their presence from early childhood, the visual field changes, and the absence of pigmentation next to these spots, I should like to characterize these spots from an artist's point of view as "soft", in contrast with drusen, which are "hard". One gets a good impression of the nature of these dots from the fundus photographs in Lindner's[26] paper (photographs 5 to 8), which are also enlarged in the atlas by Dimmer and Pillat[27] (plate 60, figures 2 to 4). Even in the photographs they look quite different from drusen of the choroid, as one can see by looking at plate 83, figures 1 to 4, and plate 84, figure 1, in the same atlas. There is no doubt that cases of marked drusen with no other eye disturbances are confused with retinitis punctata albescens in the literature and especially in Leber's Diseases of the retina, volume 2, figures 188 to 192. As Lindner has already pointed out, retinitis punctata albescens or fundus albipunctatus cum hemeralopia congenita (Lauber[28]), the hemeralopia with white-grey fundus, and the so-called Oguchi's[29] disease are probably one and the same disease only in different stages.

6. The distant vision is in both cases reduced. Case 1 sees with correction R. 6/10, L. 6/15; case 2 sees R. 6/30, L. 6/60. The near vision in the first case is R. Jaeger 9, L. Jaeger 11, rather bad vision explicable by the changes in the foveal region. In the second case, where the foveal region seems to be free from retinitis pigmentosa, the near vision is Jaeger 4 for both eyes, but here also red-free light shows beginning honeycomb degeneration (Vogt).

7. The visual field, in accord with the ophthalmoscopic findings, shows defects chiefly in the center. Case 1 has a big central scotoma, coexisting with peripheral contraction of the visual field temporally and upward, the latter to be attributed to retinitis punctata albescens. No colors are recognized anywhere. Case 2 shows only a ring scotoma for white from 10 to 30 degrees and a very small central scotoma for white and colors. The peripheral limits are normal. Hirschberg has already mentioned the occurrence of ring scotoma in the peripheral type of retinitis pigmentosa, and Köllner[2] and Gonin[1] have confirmed these findings, but in most of these cases the ring scotoma corresponds to a fundus region which is not yet visibly affected by pigment migration or other lesions. In our case 2, however, as well as in the cases of Wittmer[9], Lafon[10], Scheerer[11], and Kapuscinski[8], the ring scotoma coincides with the pigmentation in the eyeground. In cases of retinitis punctata albescens ring scotomas are also reported (Oeller[23]), usually occupying the region between 10 and 40 degrees, the region which is speckled with pigmentation in case 2 as well as in the four others just mentioned. One could suggest in explanation that a retinitis punctata albescens acquires pigment just at this area, which is predisposed for ring-scotomas in the whole group of tapetoretinal degenerations.

8. Both cases show reduced light sense: in case 1 to 1/9, in case 2 to 1/36 (five-point adaptometer of Birch-Hirschfeld), but I doubt the accuracy of these figures, since the central vision is reduced in both cases.

9. There is no consanguinity in the family of either case.

10. There is no history and no symptoms of syphilis.

In all these items these two cases are very much alike, but there are the following differences:

11. As to color sense, case 1 seems

to be color-blind, while case 2 is normal. Klainguti[30] especially has emphasized the frequent coincidence of colorblindness with retinitis pigmentosa (see also the three cases of Rieger[18]).

12. Only in case 1 can it be assumed that other members of the family are affected. Probably the mother, "who cannot find bowls, cups, etc. and must touch them with the finger", and one brother have suffered from the same eye disease. In case 2 all the members of the family have good sight. Unfortunately none of the members of either family could be examined, as they all lived either in Shantung or Kiangsu.

13. Case 1 has suffered for years from poor hearing, while the hearing of case 2 is normal. The coincidence of tapetoretinal degeneration and deafness has often been observed (Liebreich in 1861). Both the men whose cases are here recorded, however, were mentally quite clear and patient no. 1 especially was very intelligent.

14. Case 1 showed a posterior detachment of the vitreous body[25], with a ring-shaped hole such as I[31] have described before in a case of retinitis pigmentosa. In case 2 the vitreous body was normal when examined by means of the ophthalmoscope and the slit-lamp.

In the light of the foregoing, it seems to me that one has a right to differentiate, from clinical and ophthalmoscopic points of view, between central retinitis pigmentosa and the other forms of bilateral degeneration of the macula, because their clinical pictures look entirely different. Treacher Collins[32] has given us an excellent and useful division of all the hereditary forms of ocular degeneration, which he has called ophthalmic abiotrophies, but I doubt if it is possible, without causing some confusion, to group all the degenerative changes of the foveal region under the one heading of "symmetric pigment degeneration of the macula, abiotrophy of the rods in the macula".

The literature of the last decade shows great confusion in the nomenclature of the degenerative diseases of the macula. The anatomical findings of the different forms of heredodegeneration of the macula with and without dementia (Stargardt), simple heredodegeneration and the cerebromacular form (Batten), Tay-Sachs's amaurotic familial idiocy, and so on, are too few for us to group them all as pigment degeneration of the macula, under which term we should understand only the central retinitis pigmentosa described a few times in the literature and shown in the two examples in this paper. Retinitis pigmentosa or tapetoretinal degeneration of the retina seems today a well defined unit, although its ophthalmoscopic picture is so varied that it does not seem justifiable to attribute on account of its location one among this group to "abiotrophy of the rods in the macula", a heading under which clinically and anatomically such different conditions are listed. As long as the pathologic-anatomic basis for all the diseases concerned is no more certain than it is today, I propose, therefore, the following division, which easily fits into Treacher Collins' groups:

Tapetoretinal degeneration

1—retinitis pigmentosa (the usual peripheral form).
2—Retinitis pigmentosa sine pigmento.
3—fundus albescens cum hermeralopia congenita.
4—retinitis punctata albescens.
5—retinitis pigmentosa centralis.
6—hermeralopia congenita.

Degenerative diseases of the macular region (except tapetoretinal degeneration)

1—heredodegeneration of macula with or without dementia.
2—Tay-Sachs's familial amaurotic idiocy.
3—familial choroiditis (Doyne).
4—atrophia chorioideæ et retinæ gyrata.
5—atrophia chorioideæ totalis (chorioideremia).
6—Drusen.
7—choroiditis guttata (Tay's choroiditis, infiltration vitreuse de la rétine).

Further observations and pathologic-anatomic studies especially may throw more light on the anatomic origin at least of these diseases.

Summary

1. Two cases, in males, of tapetoretinal degeneration of the macular re-

gion, "retinitis pigmentosa centralis", are described. Ophthalmoscopically they show all the characteristics of a true retinitis pigmentosa, such as sclerosis of choroidal vessels, atrophy of the pigment epithelial layer, and migration of pigment.

2. Contrary to the ordinary type of retinitis pigmentosa, which shows marked concentric contraction of the visual field but normal central vision, our two cases of central retinitis pigmentosa show a central scotoma and a ring scotoma, respectively around the center, and reduced central vision, but no (case 2), or not marked (case 1) concentric contraction.

3. Neither of the two cases is associated with other congenital anomalies or with dementia. There is no syphilis either in the patient or in the family history, and there is no history of consanguinity.

4. The association of case 1 with disturbance of the auditory nerve is remarkable.

5. The central retinitis pigmentosa is in both cases associated with retinitis punctata albescens in the periphery of the fundus as well as in the zone of retinitis pigmentosa centralis.

6. Retinitis pigmentosa, although so variable in its clinical and opthalmoscopic appearance, its intensity, and its location, is a single entity from the pathologic point of view. Its central type, therefore, should not be confused with the other forms of degeneration of the macular region.

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HOMONYMOUS HEMIANOPIA
PRIMARY SIGN OF TUMORS INVOLVING LATERAL PART OF THE TRANSVERSE FISSURE

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The surgical anatomy of homonymous hemianopia is discussed with special reference to the roof of the lateral part of the transverse fissure, where the fibers of the optic tract are closely assembled. Thirteen cases are discussed, and three cases are reported in which the hemianopia was primary and clear cut. The conclusion is reached that this latter symptom is characteristic of lesions originating in the roof of the lateral part of the transverse fissure. From the section on ophthalmology of the Mayo Clinic. Read before the section on ophthalmology of the American Medical Association, July 8 to 12, 1929.

In the verified cases of supratentorial tumors observed at the Mayo Clinic in the last ten years, a diagnosis of tumor of the basal ganglions has been made at necropsy in thirteen instances. In two of the cases the initial symptom of an intracranial lesion was noticeable homonymous hemianopia of rapid onset. Somewhat later signs of a contralateral hemiplegia developed and the patients came to the Mayo Clinic for examination. As a defect in the visual fields was noticeable in only two cases in this group, a more detailed study was made of the origin and site of the tumors in an endeavor to ascertain the reason for the primary sharp-cut homonymous hemianopia.

Anatomically the basal ganglions of the telencephalon[1] are four deeply placed masses of gray matter, independent of the gray cortex situated in each cerebral hemisphere. These masses are known as the caudate, lentiform and amygdaloid nuclei, and the claustrum. The two former, together with gray bands connecting them through the anterior part of the internal capsule, constitute the corpus striatum, or striate body. Inferior to these ganglions is the transverse fissure.[2] This name is given to the continuous cleft through which the tela choroidea of the third ventricle and the choroid plexuses of the inferior horns of the lateral ventricles are introduced into the interior of the brain. The transverse fissure consists of an upper or middle part and two lateral parts. The lateral parts of the transverse fissure are the inferior parts of the choroidal fissures which are situated between the fimbria and the roof of the interior ventricular horns. By withdrawal of the choroid plexus each fissure is converted into an artificial gap which leads directly from the exterior of the brain into the interior of the inferior horn of the lateral ventricle.

The optic tract is situated in the superior part or roof of the lateral portion of the transverse fissure (figures 1 and 2) just lateral to the basis pedunculi and mesial to the stria terminalis. This anatomic relationship persists to the external geniculate body. A tumor originating in the roof of this fissure would produce sharp-cut homonymous hemianopia early in the course of the disease because the fibers are so concentrated in this region that a relatively small lesion may readily result in interruption of the conductivity of all the fibers in the visual tract. The significance of this anatomic relationship was shown by Henschen,[3] who proved that the external geniculate body is the only true visual ganglion, and that all the visual fibers of the tract enter it and end therein. Numerous fibers of the tract end in the pulvinar of the optic thalamus and probably serve the involuntary reflexes of the body. Others reach the corpora quadrigemina through the medial optic root and serve as the afferent limb of the pupillary reflex arc.

Neither the pulvinar of the optic thalamus nor the superior colliculi of the corpora quadragemina contain visual fibers. A lesion of these ganglions does not cause visual field defects, but sometimes it modifies the pupillary reflex and affects the upward conjugate movements of the eyes. It therefore follows that all lesions in this region causing visual disturbance in the form of field defects must affect the function

of the external geniculate body or the optic tract. Wilbrand and Saenger[4] have not observed a tumor limited to the external geniculate body, but in the literature there are reports of several cases of tumors in the basal ganglions which have caused hemianopia through pressure on the geniculate body or optic tract. These visual disturbances always occur as homonymous hemianopic

situated in the basal ganglions until focal symptoms arise from secondary effects on the internal capsule. As a rule homonymous hemianopia is a late associated sign, motor and sensory disturbances occurring much earlier and more commonly.

In the thirteen cases observed in the Mayo Clinic, eight common symptoms exclusive of the ophthalmologic symp-

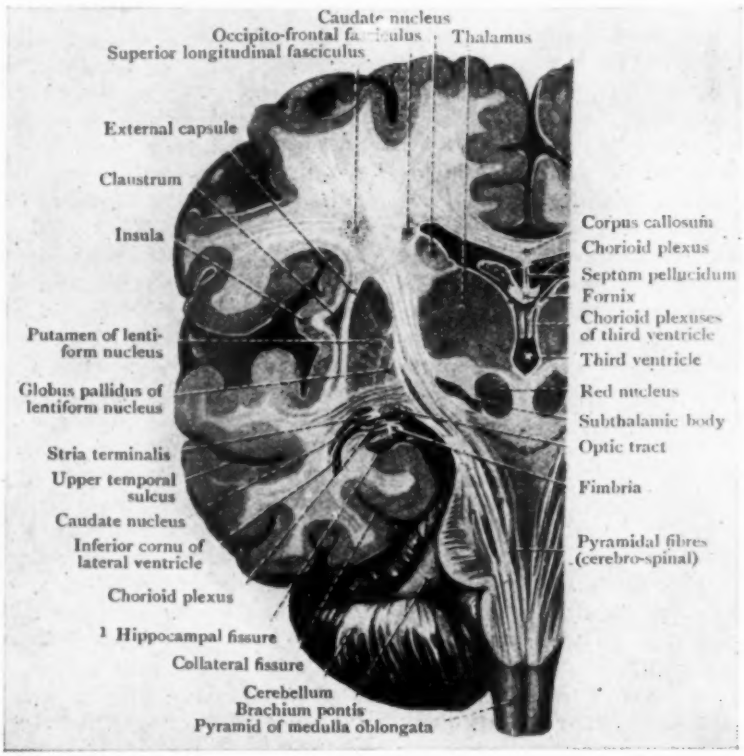

Fig. 1 (Lillie). The optic tract situated in the roof of the lateral part of the lateral fissure, and its relationship to the basal ganglion. (From Cunningham, "Manual of practical anatomy.")

defects in the visual field. In support of Henschen, Wilbrand and Saenger[5] conclude that tumors of the basal ganglions may exist without localizing symptoms. The associated symptoms show themselves for the most part in their influence on the internal capsule. The most significant visual disturbance is homonymous hemianopia, probably due to influence on the adjacent lateral geniculate body. Cassirer[6] concludes that it is difficult to identify tumors

toms were noted: (1) headache in twelve cases; (2) hemiplegia, partial or complete, in eleven cases; (3) hemiparesthesia and sensory disturbances in eight cases; (4) nausea and vomiting in four cases; and (5) unilateral facial paralysis for mimic movements in three cases. Tremors, incoordination, speech defects, ataxia and memory changes were late manifestations.

The ophthalmologic data were not significantly definite except that the

homolateral pupillary light reflex was diminished in six cases, and convergence was diminished in two cases. In two cases conjugate weakness of elevation and in one case homolateral conjugate paralysis were noticed. The ophthalmoscopic examination revealed normal fundi in five cases and bilateral choked disks, ranging from 1 to 5 diopters in elevation, in eight. The perimetric fields were within normal limits in all but two cases.

the patient sometimes said one word when he meant to say another. This had become progressively worse, although he was still able to talk fairly well. Six months later he noticed gradual weakness of the right arm and right leg about noon, following a morning of work. By night he had to drag his right leg and could scarcely raise his right arm. The following day he would be unable to walk and was barely able to move the right arm. Since then he

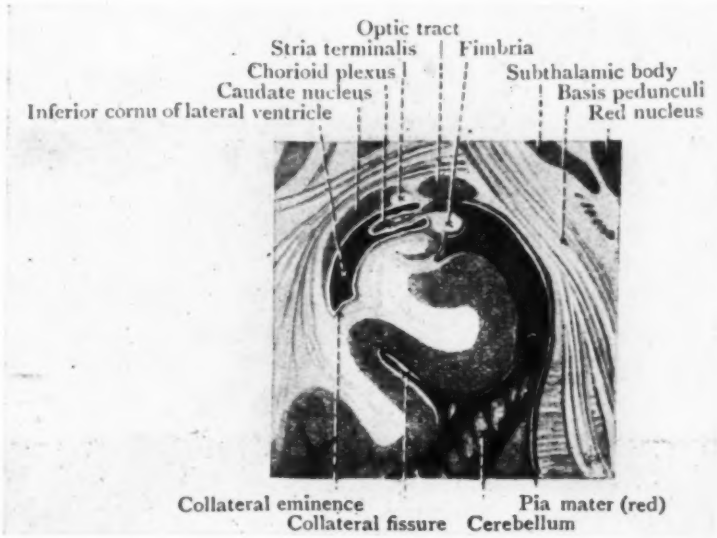

Fig. 2 (Lillie). Anatomic relations enlarged from figure 1 to show optic tract in roof of lateral part of transverse fissure.

In cases 1 and 2, which are reported here, homonymous hemianopia was the primary sign of an intracranial lesion. Although a diagnosis was made at necropsy of tumors of the basal ganglions, a more detailed study showed that they originated in the roof of the lateral part of the transverse fissure, which is inferior to the basal ganglion.

Report of cases

Case 1: A farmer, aged fifty-three, came to the Mayo Clinic because of partial paralysis of the right side. Four years before admission, episodes had occurred in which many red spots were seen in the right field of vision and later partial blindness in the right field of vision. Two and a half years later had lost motion of the right arm and leg. Sensation in the right arm and leg was not entirely gone but it felt numb and cold.

The systolic blood pressure was 108 and the diastolic 75. Examination of the urine and the Wassermann reaction of the blood and spinal fluid were negative. Roentgenograms of the head revealed some evidence of increased intracranial pressure. Vision of the right eye was 6/10; of the left 6/10. The pupils and reflexes were normal. The ophthalmoscopic examination was negative. The perimetric fields revealed sharp-cut right homonymous hemianopia for form and colors (figure 3). Partial right hemiplegia and weakness of the right facial nerve were noted. Dur-

ing the neurologic examination the patient had one generalized convulsion.

and necrotic subcortical glioma of the temporal lobe situated in the roof of

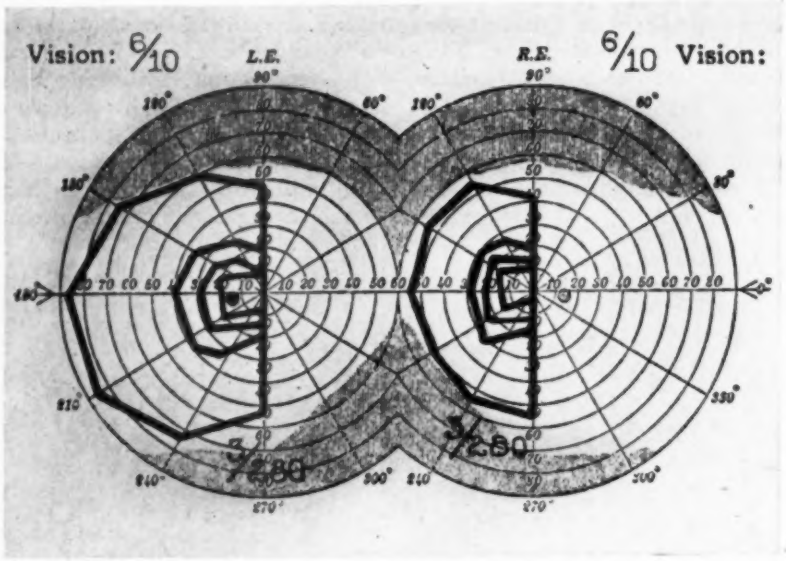

Fig. 3 (Lillie). Case 1, perimetric fields showing complete sharp-cut right homonymous hemianopia for form and colors. The fundi were negative.

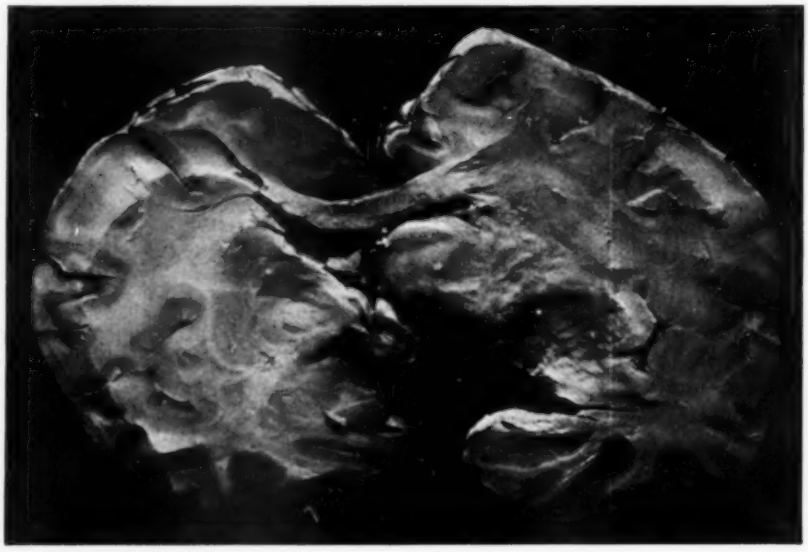

Fig. 4 (Lillie). Case 1, gliomatous tumor involving the optic tract in the roof of the lateral part of the transverse fissure.

The patient died suddenly four days after the examination had been made and necropsy revealed a hemorrhagic

the transverse fissure and impinging on the left optic tract and left basis pedunculi (figure 4).

An interesting early feature in this case was the visual hallucinations, not unlike those produced by lesions involving the optic radiations. But the primary homonymous hemianopia was unlike the hemianopia produced by temporal lobe tumors, which, as a rule, is a late manifestation and usually is slowly progressive. The hemianopia defects produced by temporal lobe tumors are mainly homonymous quadrant defects and are not noticed by the patient. This has been proved by Cushing[7] and by me.

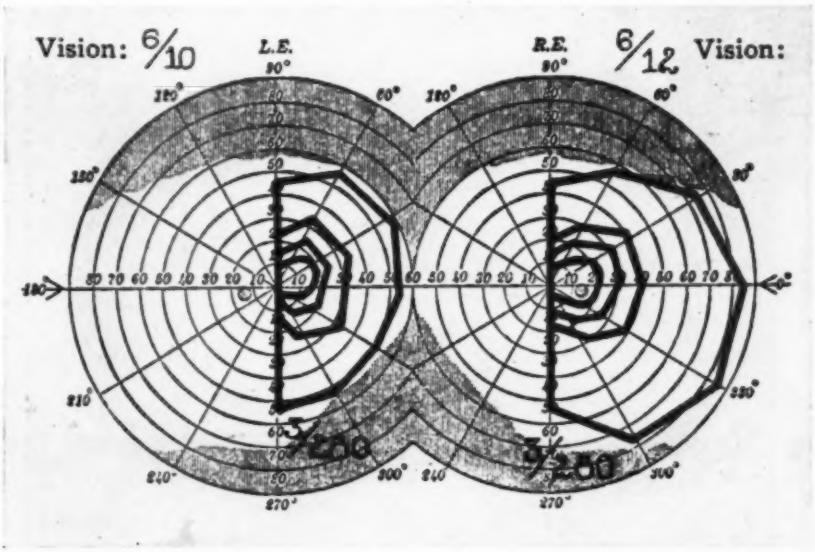

Fig. 5 (Lillie). Case 2, perimetric fields showing complete sharp-cut left homonymous hemianopia for form and colors. The fundi were negative except for slight pallor of discs.

Case 2: A farmer, aged forty-four, came to the Mayo Clinic because of paralysis of the left side. He had always been well until one year before examination, when his wife noticed that he drove his car crookedly, usually pulling it over toward the right. She then noticed a slight disturbance in speech. Following this he complained of some difficulty in using a saw and a screwdriver. When he was butchering, his wife noticed that "he just did not cut the meat right." Four months later he found that he could not milk with the left hand, and shortly afterward the left foot began to drag and he was aware of progressive weakness of the left side.

The systolic blood pressure was 135 and the diastolic 90. Examination of the urine and the Wassermann reactions of the blood and spinal fluild were negative. A roentgenogram of the head was negative; that of the chest revealed a slight mediastinal thickening and an old fracture of the left seventh and eighth ribs. Vision of the right eye was 6/12 and of the left 6/10. The left pupil was larger than the right and did not react to light, but was normal in accommodation. There was slight pallor of the disks. The perimetric fields revealed complete sharp-cut left homonymous hemianopia for form and color (figure 5). Left hemiplegia, with increased tendon reflexes and a spastic gait on the left side, was noted. Mild tremor of the left arm and leg and a moderate degree of aphasia were also present.

Right frontotemporal exploration was done without the disclosure of any signs of a tumor. Colorless cerebrospinal fluid was removed from the left ventricle without collapse. Three days later the patient died and necropsy revealed a glioma in the region of the

right basal ganglion compressing the optic tract and basis pedunculi. On serial section it was found that the main mass of the tumor originated in the roof of the lateral part of the transverse fissure, involved the optic tract, and invaded the basal ganglion secondarily (figure 6).

Visual hallucinations were not present in this case, as in case 1, but the severe headaches which were worse at night. Some of the attacks were accompanied by vomiting. The patient became drowsy, and for the last three weeks had some vertigo. He had noticed slightly progressive weakness of the left hand. He did not shave the left side of his face and when asked why said that "the razor would not cut on that side."

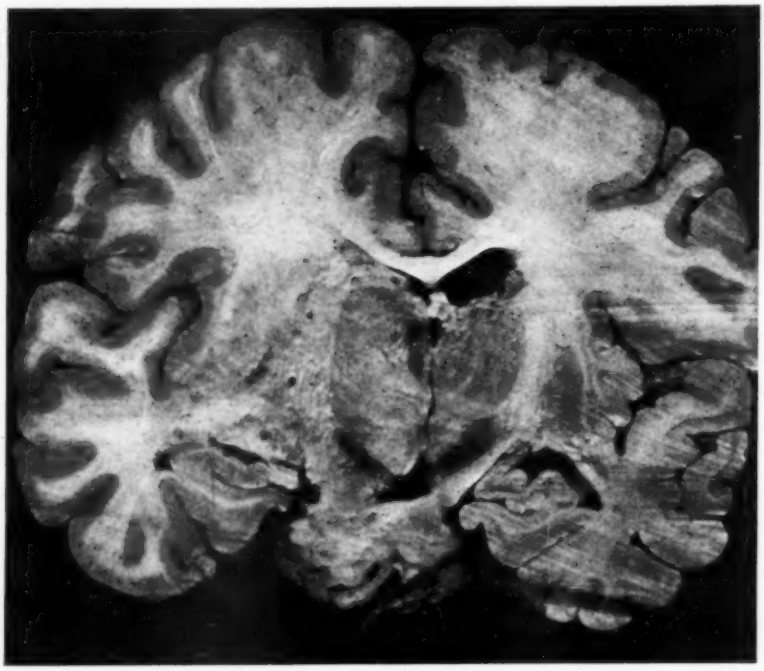

Fig. 6 (Lillie). Case 2, gliomatous tumor involving the optic tract in the roof of the lateral part of the tranverse fissure.

remainder of the history and the sequence of events were similar.

Although the data concerning case 3 were not verified by necropsy, they are presented to show their similarity to those of case 2.

Case 3: A carpenter, aged forty-three, came to the clinic because of headaches of four weeks' duration. He had been well apparently until five weeks before, when, while driving an automobile, he collided with an oncoming car on the left. At about this time his wife had noticed that the left side of his face was flaccid and the right corner of his mouth was drawn to the right. A slight cold developed, and he began having

The systolic blood pressure was 118 and the diastolic 72. Examination of the urine and the Wassermann reaction of the blood and spinal fluid were negative. Roentgenograms of the head and chest were negative. Vision was normal in both eyes. The left pupil was larger than the right and the light reflex was slightly diminished. Bilateral acute choked disks, 2 diopters each, a questionable conjugate weakness to the left, and complete sharp-cut left homonymous hemianopia for form and colors were present (figure 7). Neurologic examination revealed mild left hemiparesis with slight weakness of the left half of the face. Sensory disturb-

ance could not be elicited. Mild incoordination of the left arm and leg and left astereognosis were noted.

The left temporal area was explored surgically. The brain was found to be under considerable tension, and when the cannula was passed through the upper temporal convolution inward and a little upward, a tumor of firm consistency was encountered at the depth of 4 cm. A specimen was not removed for examination, but a diagnosis was made of tumor of the right basal ganglion. The patient had an uneventful convalescence. The data on subsequent examinations were essentially unchanged.

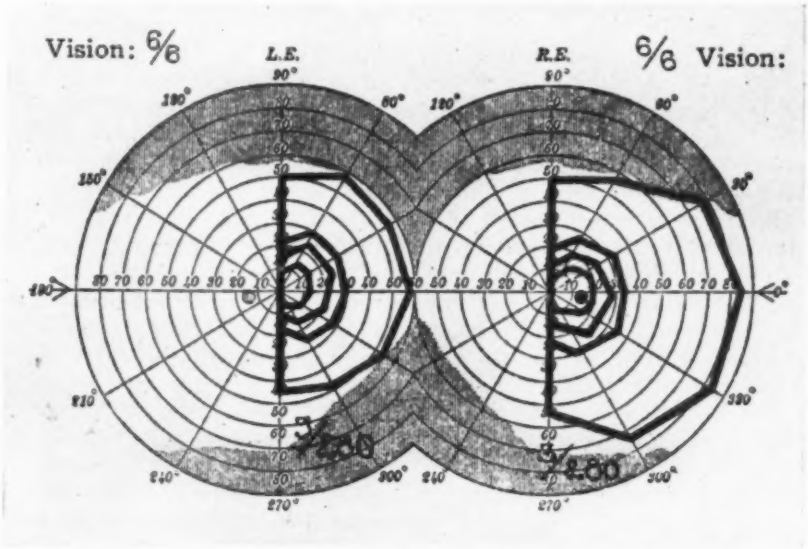

Fig. 7 (Lillie.) Case 3, perimetric fields showing complete sharp-cut left homonymous hemianopia for form and colors. There were bilateral acute choked discs of two diopters each.

Although a surgical diagnosis of tumor of the right basal ganglion was made, the tumor probably originated in the region of the roof of the lateral part of the transverse fissure. This conclusion was reached in view of the fact that none of the verified tumors of the basal ganglion observed in the clinic have produced primary complete homonymous hemianopia.

Summary

The clinical data in these eleven cases of tumor of the basal ganglion verified at necropsy support the conclusions of Henschen, Wilbrand and Saenger, and Cassirer in that all focal signs are late manifestations and due to involvement of neighboring structures, such as the internal capsule, superior colliculus (anterior quadrigeminal body), posterior longitudinal bundle, basis pedunculi and, rarely, the optic tract and external or lateral geniculate body. Figures 1 and 2 show this relationship clearly. These associated signs were demonstrations in the frequency of occurrence of hemiplegia, hemiparesthesia, conjugate paralysis, and homolateral pupillary reflex changes. The incidence of increased intracranial pressure was relatively high, bilateral choked disks being present in eight of the eleven cases, possibly as a result of the mesial displacement of the optic thalamus, which usually partially obliterated the third ventricle. All of the perimetric fields were normal. In two cases in which sharp-cut homonymous hemianopia was the initial sign of an intracranial lesion, tumors of the basal ganglion were found at necropsy. A more detailed study revealed the exact origin of these tumors.

In a group of sixty verified temporal

lobe tumors reported previously,[8] homolateral pupillary reflex disturbance or conjugate paralysis was not observed. In forty-five of the cases bilateral choked disks showing a swelling ranging from 0.5 to 7 diopters were noted. In eight cases the perimetric fields were normal. In ten cases homonymous quadrant defects for colors only were noted; fifteen homonymous quadrant defects for form and colors were elicited. Complete homonymous hemianopia for colors with normal fields was found in three cases, and complete homonymous hemianopia for form and colors was elicited in fifteen cases; an interesting feature in these fifteen cases was the late phenomenon of complete hemianopia, a distinct contrast to the primary noticeable hemianopia in the three cases presented here.

Vascular insults, as infarctions or hemorrhages, which involve the temporal lobe, internal capsule, or external geniculate body and result in rapid sharp-cut homonymous hemianopia can usually be diagnosed readily, since most vascular insults are episodal in character. The defect may remain stationary, although a noticeable tendency to regression is the rule. In case of tumor, slow progressive increase in focal signs and symptoms is the usual procedure. Sometimes the tumor syndrome is complicated clinically by recent hemorrhage into the region of a gliomatous tumor. With this occurrence, regression of some of the recently acquired signs and symptoms may occur and result in some confusion. Usually a history of previous steady progression can be obtained, and the basic neoplastic lesion is not overlooked.

In cases in which an initial precipitous homonymous hemianopia is noticed and is followed some time later by progressive hemiplegia, or hemiparesthesia associated usually with homolateral diminution of the pupillary light reflex, all lesions except tumors can generally be excluded as the causative factor. This syndrome was rarely observed, but when it did occur the tumor was always situated in the roof of the lateral part of the transverse fissure involving the optic tract primarily, and extending to affect the basis pedunculi or internal capsule secondarily. The recognition of this syndrome is of clinical significance, since the site of the lesion makes it practically inaccessible for surgical removal. A correct preoperative diagnosis will aid the surgeon in the proper management of the case.

Conclusions

1. Tumors originating in the roof of the lateral part of the transverse fissure produce primary sharp-cut homonymous hemianopia, followed later by progressive hemiplegia or hemiparesthesia and associated changes.

2. The sequence of events is characteristic of lesions in this region, and can be distinguished from those originating in the temporal lobe or basal ganglion.

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SUBCONJUNCTIVAL IRIDECTOMY FOR GLAUCOMA

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The operation of subconjunctival iridectomy is described. Eight cases on which this operation was performed are reported. In the limited time that has elapsed since operation the results have been very satisfactory. Read before the Kansas City Society of Ophthalmology and Otolaryngology, September 19, 1929.

Though ultimately the cure of chronic simple glaucoma will lie in the discovery of the underlying disease and its eradication, as yet this discovery has not been made and reliance must be placed on treatment of the symptom of hypertension. Much may be done with miotics, but in many cases these fail and in others the continual treatment necessary seems impractical and operation is indicated. No operation has proved entirely satisfactory. Simple iridectomy too often fails to result in long continued reduction of tension; operations for subconjunctival drainage are apt to produce hypotension and often the channels finally become obstructed.

Incisions in the sclera, if not too severe for the integrity of the eyeball, will close—be they made by trephine or knife. Corneoscleral openings remain patent because of the corneal filtration. Iridotasis is effectual because cells from the posterior surface of the iris line the wound and prevent its closure. When a conjunctival flap is replaced a very firm union is formed, exactly the outcome least desired when subconjunctival drainage is sought. To avoid this firm postoperative union and to gain the advantage of possible internal drainage and a permanent fistulous subconjunctival channel, the operation of subconjunctival iridectomy was devised.

Dr. A. E. Ewing, my former associate, for several years had been performing an iridectomy in which he endeavored to keep the point of the knife beneath the conjunctiva. He drew the iris to the side and excised it, in so far as possible, without exposure. Postoperative results were excellent. The difficulty of the procedure, however, was great.

I wish to describe an operation which I have been using for the past two years, modifying it and changing it somewhat as experience has suggested; and to report briefly the results in ten eyes in eight patients operated on by this method.

The eye is anesthetized with three instillations of cocaine five per cent combined with one-tenth part of adrenalin 1 to 1,000 at three minute intervals. This is followed by one minim of the same solution injected subconjunctivally at the upper limbus. Three minutes later the entire upper half of the conjunctiva is bulged outward by a subconjunctival injection of normal saline. The conjunctiva is seized just below the mid-horizontal line with a double fixation forceps and a Graefe knife is introduced into the conjunctiva at a point about three millimeters above the upper border of the limbus and in a vertical line with the temporal border of the cornea. The knife is then entered into the anterior chamber in a line directed toward the tip of the nose. The handle is then depressed and a counter puncture made at a point which will cause the finished section to be of approximately the upper fifth of the circumference of the cornea. The section is now completed upwards on a plane with the iris, the point of the knife remaining subconjunctival. At the moment of exit of the blade it is tilted somewhat forwards. The knife is then withdrawn through the original puncture wound in the conjunctiva. The bleb will still be much elevated at this period. The puncture wound is now enlarged to about four millimeters. Through this an iris forceps is passed into the anterior chamber and the pupillary border of the iris seized and drawn upwards through the limbus incision. The iris is somewhat everted by this procedure. The iris is now pulled firm-

ly into the temporal end of the incision and that part which extends through the scleral section is excised, the scissors being introduced subconjunctivally. This completes the operation which has been performed entirely subconjunctivally.

I have not yet had an opportunity to study an excised eyeball on which this operation has been performed successfully so am not certain if any iris tissue remains in the limbus section, but believe the continued drainage may be due in part to the presence of a certain amount of this tissue there. A bleb, larger but not unlike the trephine bleb, results from this operation. The important difference is the much greater thickness of the overlying conjunctiva. This, I believe, undoubtedly gives greater protection from infections. One patient contracted a severe pneumococcus conjuctivitis several months after operation. The bleb remained unchanged during and after the inflammatory process and there was no extension of the infection subconjunctivally. The area of drainage did not share in the inflammatory reaction and stood out as a white, clear surface surrounded by the red of the reaction.

In some cases the bleb disappeared but the tension remained low.

Some temerity is required to present an operation used only in ten cases and of which the oldest is two and a half years, but it has been my experience that if the drainage is going to fail, in most cases this will take place within the first few months. This report will obviously give no light on the matter of late complications and it must certainly be understood as only a very early and incomplete report containing perhaps a suggestion that may be of value.

The following is an analysis of ten eyes on which this operation was performed.

Case 1: Mr. L. H. N., aged thirty-two years. O.D., without glasses, vision 20/96. The field was everywhere within ten degrees of center and mostly within five degrees. Tension was 11 mm. (Schiøtz). The disc was deeply and extensively cupped. The reason for this low tension is not known. Possibly the cupping was congenital. Tension, field and vision have not changed during eight years of observation of this eye. O.S. vision 20/30, with glasses. Tension was 43 mm. (Schiøtz). The field was about three quarters normal. The disc had been normal when first seen six years previously, but had gradually become increasingly excavated. Miotics had failed to keep the tension normal. An operation was performed on the left eye on March 24, 1927. Two and one-half years later, on September 14, 1929, no drops having been used in the left eye for over a year, the tension was 10 mm. and vision with glasses 20/30 and the field showed no change.

Case 2: Miss L. W., aged sixty-seven years, was seen first in July, 1927. She had been having occasional attacks of obscuration of vision in the right eye with slight pain for the past year. She had been treated elsewhere in the past month for glaucoma. The vision of the left eye had become blurred three days previously. Examination revealed very shallow anterior chamber, reduced vision, hypertension. A diagnosis of acute glaucoma in the course of chronic glaucoma was made. Eserine and pilocarpine proved ineffectual. Glaucosan reduced the tension from 77 (Schiøtz) to 35 mm. but this was only temporary. On the twenty-third day a subconjunctival iridectomy was performed. Four days later the tension again arose, but in forty-eight hours returned to normal and has remained so. On August 17, 1929, tension in each eye was 17 mm. Vision improved greatly after the operation. Probably any iridectomy would have accomplished as much but the case is included for the sake of completeness.

Case 3: Mrs. E. B., aged fifty-six years, was seen first in 1918 at which time no glaucoma was noted. She was not seen again until November, 1927, at which time there was deep and extensive cupping in the right eye with a tension of 60 mm. (Schiøtz). Cupping was less marked in the left eye with a tension of 30. A subconjunctival iridectomy was performed on December 4, 1927, on the right eye. The patient has

been seen monthly since that time and the tension has remained between 20 and 25 mm. Unfortunately, however, the field has diminished about one-fifth in these two years. The other eye has been controlled, except for the field, by miotics. Central vision has remained unchanged.

Case 4: Mrs. J. M., aged forty-seven years, was treated with miotics from November 4, 1925 to November 8, 1928 for a chronic simple glaucoma in each eye. During the last four months it had been necessary continually to increase the strength of drops in order to keep the tension within reasonable limits and even with the more powerful drops the tension could not be brought below 30, so an operation was decided on and performed on one eye on November 8, 1928. An operation was performed on the second eye on April 2, 1929. The fields and central vision have remained unchanged. A good bleb is present in each eye and tension has averaged 12 mm. in each eye to date, without the use of miotics.

Case 5: Mrs. L. S., aged seventy-one years, had been treated in New York for three and one-half years for chronic simple glaucoma. When seen by me on May 8, 1929, in spite of having used two per cent pilocarpine three times a day and eserine one and one-half per cent once a day in each eye, the tension was: right eye 47; left eye 43 mm. The fields were about half of the normal and the discs were extensively cupped. Subconjunctival iridectomy was performed on one eye on May 13 and ten days later on the other. Three months later the tension was reported by her New York physician as 17 mm. in each eye with the eyes in good condition.

Case 6: Mrs. H. R., aged seventy-four years, had been watched for nine years. Early glaucomatous changes had been noted in the left eye for one year. The tension rose to 43 mm. and operation was performed on April 26. A good bleb was obtained and the tension two months later was 18 mm. in the operated eye.

Case 7: Mr. A. S., aged seventy-two years, is, perhaps, especially interesting, as a trephine was performed on one eye and a subconjunctival iridectomy on the other. He had a chronic simple glaucoma with about fifty per cent contraction of the fields, especially on the nasal side. The tension previous to operation was 37 mm. and the vision 6/30 in each eye. An Elliot trephining was performed on the right eye on December 10, 1928, and a subconjunctival iridectomy on the left, December 28, 1928. The tension on March 14 in the trephined eye was 16 while that in the other was 22 mm. The eyes were in the same condition at the end of June, and on September 15, tension O.D. was 8, and O.S. was 25 mm.

Case 8: The last to be done was a failure. Mrs. E. R., aged fifty-five years, whose eye was very hard, 65 mm. (Schiøtz), from a glaucoma, secondary to intraocular hemorrhage and retinitis proliferans, underwent an operation in July, 1929. Operation was most difficult because of poor anesthesia, friability of tissue and almost uncontrollable hemorrhage. A small bit of iris was finally extracted under the flap, a good bleb resulted, but within a week hypertension returned and enucleation has since been performed.

Comments: Except for the last case, in which any operation would probably have failed, excellent results have been obtained. In only one patient, for a time following operation, was a weak solution of pilocarpine necessary as the tension tended to rise to about 30 mm., but this did not continue and drops are no longer used. Of course it is much too soon to prophesy that drainage will remain adequate indefinitely in these cases, but at least the early results have been gratifying.

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ACCESSORY EFFECTS OF THE CORRECTING GLASS BY ITS POSITION BEFORE THE AMETROPIC EYE

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The qualities of lenses are carefully discussed with special reference to (1) the prismatic effect of a correcting lens, (2) the effect of tilting the correcting lens, and (3) the effect of the distance between the eye and the correcting lens. Read before the American Academy of Ophthalmology and Otolaryngology, October 21 to 25, 1929.

The principal axis of a lens is a line, perpendicular to the plane of the lens, upon which lie the centers of the curved surfaces and all the cardinal points. This line passes through the vertices of the curved surfaces and is, therefore, the pole of the lens. The principal points are so situated on the axis that every ray which before being refracted was directed toward the first, seems, after refraction, to come from the second, and takes a final direction parallel to that from H, and behind from H′. For example, the distance between the biconvex lens and the meniscus (figure 1) would be measured between the adjacent principal points, and not from the surfaces of the lenses.

It can be readily seen from the diagram that the usual assumption that a ray directed to the optical center emerges in the same direction, is not generally correct. For weak, flat lenses that may be considered infinitely thin

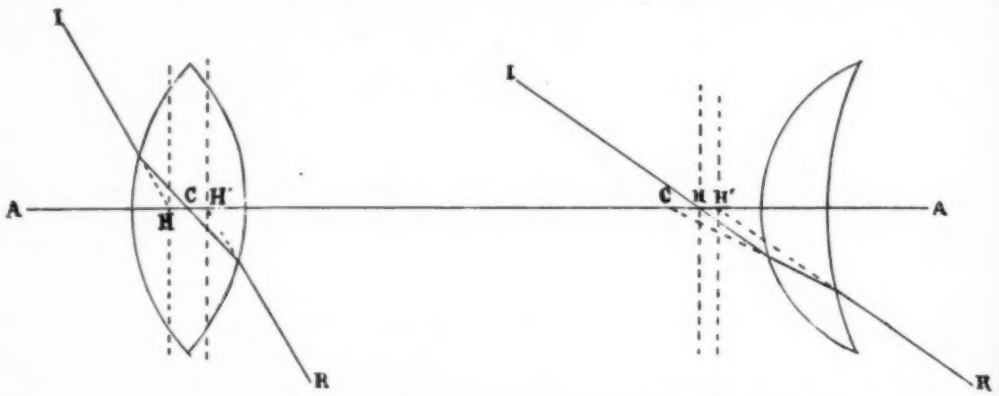


Fig. 1 (Cowan). Accessory effects of the correcting glass by its position before the ametropic eye.

which it had at first. This means (according to the theory of Gauss) that if an eye were placed at R (figure 1) the ray I that enters the lens in a direction toward H, the first principal point, will appear to leave the lens as if it came from H′, the second principal point. This ray, in passing through the lens, cuts the principal axis in a point (C) called the optical center.

Theoretically, then, the principal planes erected at H and H′ take the places of the first and second surfaces of the lens, and the actual curved surfaces are disregarded. All distances from the lens are measured in front

there will be no noticeable error, but in the modern, deeply curved lenses, especially in the higher powers, the principal points, and not the optical center, must be used to indicate the position of the lens. In any ordinary ophthalmic lens, however, we need only consider one principal point; the one that lies closest to the eye.

It should also be remembered that the positions of the optical center and the principal points vary with the shape of the lens. The practice of placing a mark on the surface of the lens corresponding to the pole, and calling this the optical center, is wrong in most cases. The

optical center lies on the curved surface of a plano-convex or plano-concave lens, but in every other it lies either within or entirely outside the glass. There are two principal points and one optical center in a spherical lens, but in a spherocylinder there is one optical center and two principal points for each principal meridian, and the points for every other meridian of the lens lie between these two extremes, forming a line along the axis.

Therefore, in order to be correct, we shall speak of the principal point (meaning the one nearest the eye) with reference to the sagittal position of the correcting lens and of the pole of the lens with reference to its tangential position before the eye.

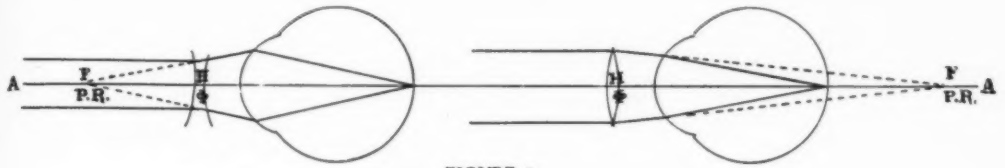


FIGURE 2

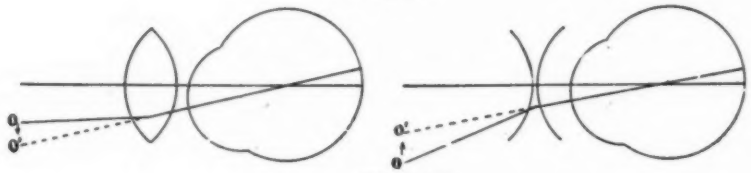


FIGURE 3

Figs. 2 and 3 (Cowan). Accessory effects of the correcting glass by its position before the ametropic eye.

The correcting lens is in the ideal position before an ametropic eye when its pole coincides with the visual line (AA, Fig. 2), its second principal point (H) coincides with the anterior principal focus (Φ) of the eye, and its posterior focus (F) coincides with the punctum remotum (P.R.) of the eye. Any variation in position introduces a more or less serious error.

Prismatic effect of a correcting glass

It is evidently less difficult to adjust a pair of glasses to the pupils or corneas which are easily seen than to the visual lines which are not seen. The visual line does not usually pass through the center of the pupil. This is especially true where there is a wide angle alpha. In cases of irregular or displaced pupils, from whatever cause, the visual line may not pass through the pupil at all. For this reason, generally speaking, it is wrong to adjust the lenses with the centers of the pupils. In ordinary cases, with a low refractive error, the difference between the center of the pupil and the visual line does not represent a noticeable error, but in exceptional cases proper allowance, particularly in the vertical direction, should be made. For instance, in aphakia with a strong convex lens and irregular or displaced pupils, failure to adjust the poles of the lenses to coincide with the visual lines may cause a great deal of discomfort and annoyance to the patient.

In a lens of one diopter the prismatic effect is one prism diopter for every centimeter distance from the pole. This means that in a lens of ten diopters we have the effect of one prism diopter for every millimeter distance from the pole. The careful consideration of the prismatic effect of ophthalmic prescription lenses is of great practical importance.

Where the refractive error is equal in both eyes the conjugate movements of the eyes bring them into what may be called identical or corresponding points of the lenses, and the deviations are symmetrical. The conjugate upward, downward, or horizontal movements of the eyes direct them through portions of the lenses which give the effect of a

pair of prisms, bases up, down, or out and in. There will be very little difficulty for the patient, but as objects will not be seen in their real position unless the visual lines pass through the poles of the lenses, it is often necessary to explain to him that objects will be apparently displaced in the direction of the apices. For example, on looking down with convex lenses the pavement will appear to be farther away, and with concave lenses it will appear to be closer than it actually is (figure 3). The object will also appear to move with the movement of the eyes toward the edge of the convex lens, and in an opposite direction in the concave lens.

Besides the apparent displacement and movement of an object, there is the magnification or elongation in the principal plane of the prism when the base is turned toward the object.

When the lenses are adjusted to parallelism of the visual lines they will have, during convergence, the effect of a pair of prisms bases in or bases out, depending on whether the lenses are concave or convex (figure 4). In the first instance—bases in—there will be less convergence needed, and in the second instance, more convergence of the visual lines. The same effect, reversed, will be achieved for distance when the lenses are adjusted for reading. It should be remembered that an alteration of the visual lines has a more or less direct influence on the judgment of distance, size and form of objects, and other phenomena associated with binocular vision.

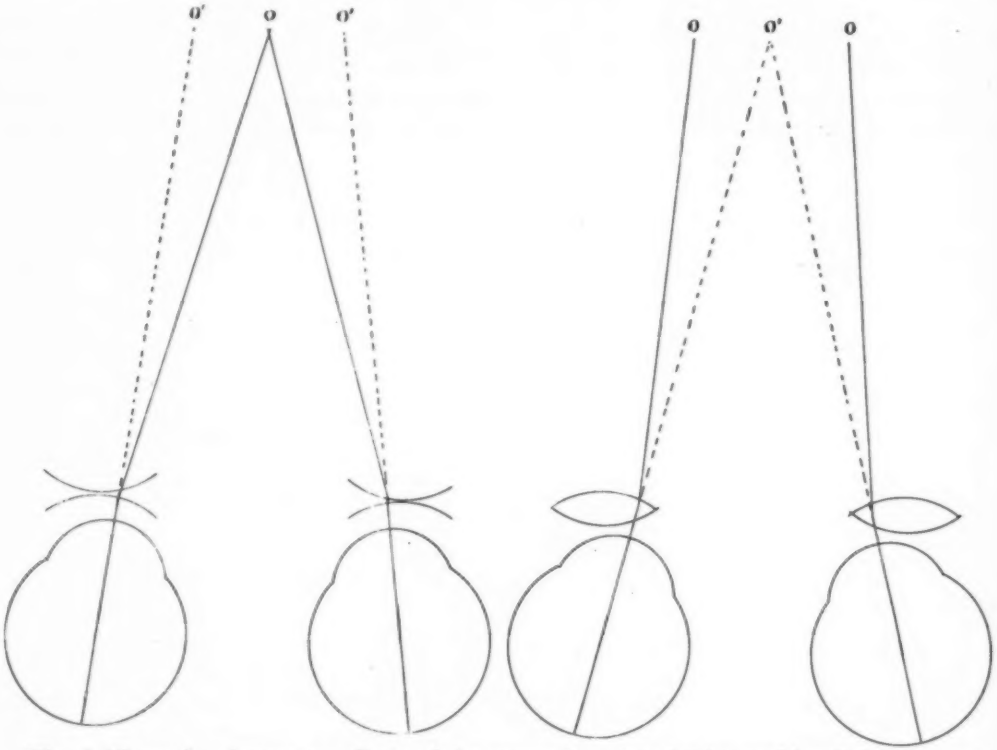


Fig. 4 (Cowan). Accessory effects of the correcting glass by its position before the ametropic eye.

In bifocals the upper and lower portions can be adjusted for their respective distances; but where the error is high and the same glasses are worn for both far and near, the problem may not be so easily solved. In some cases it will suffice to adjust the poles of the lenses to the mean distance of the visual

lines between parallelism and convergence, but in exceptional cases it may be necessary to have two pairs of glasses, one for far and the other for near. In certain forms of muscle imbalance it may even be desirable to make use of this prismatic effect for one or other distance.

It need hardly be stated that prisms bases in or out can be more easily tolerated than prisms bases up and down. This effect is the result when glasses are crooked—one pole up and the other pole down—or when one eye is higher than the other. In high myopia or in aphakia, very little displacement of the correcting lenses will produce an effect equal to two or three prism diopters, a vertical displacement sufficient to cause great discomfort to the patient.

The prismatic effect of the correcting glasses becomes a serious matter sometimes in anisometropia or, in what is the same thing, astigmatism in which the principal meridians are so widely different that a relative anisometropia is produced. As already stated, where the correcting glasses are alike or nearly so, the conjugate movements of the eyes bring them into such corresponding parts of the glasses that the apparent displacements and distortions are in the same direction for both eyes; but where there is a notable difference in the strength of the lenses the prismatic effect is unequal, with consequent separation of images and either diplopia or disturbed muscle balance. Even in these cases the deviation may not be so great that it cannot be overcome for horizontal conjugate movements, but in vertical or oblique movements the deviation cannot be disregarded. The patient should be instructed to turn the head so that he looks through the poles of the lenses. Where this cannot be done, as for instance in reading, it will be necessary to use a prismatic segment to neutralize the error.

Effect of tilting of the correcting glass

When a pencil of light strikes a spherical lens in such a direction that it is not perpendicular to the refracting surface the emergent pencil will be astigmatic. The lens will be equivalent to a sphero-cylinder with the greatest power in the meridian in which it is tilted. The cylindrical effect of a tilted lens is sometimes of considerable importance in practice.

In a 4 diopter lens about 0.50 diopter cylinder is produced in the center by a tilting of 20°. If a sphero-cylinder lens is tilted in a meridian opposite to its axis the power of the cylinder is increased. On the other hand, when a sphero-cylinder is tilted in the same direction as the axis the power of the cylinder is decreased, so that in certain lenses a weak cylinder may be entirely eliminated.

Thus a pair of lenses adjusted for distance may be increased or decreased in cylindrical power when the eyes are turned down and strike the glasses obliquely in reading. The same glasses when tilted for reading introduce an astigmatic error when the patient looks straight ahead. This is the reason why it sometimes occurs that a presbyope, after using improperly adjusted reading glasses, is uncomfortable when given the cylinder he accepted in the manifest refraction. With astigmatism against the rule, after wearing spherical lenses, he could have found by looking obliquely through his lenses that he could make them a fairly good substitute for sphero-cylinders; or he could in the same way bring a pair of too weak cylinders up to the proper strength. After having his astigmatic error properly corrected he proceeds to overcorrect his astigmatism by persisting in his old habit of tilting his glasses. Similarly, glasses placed at the proper angle for reading may introduce astigmatic errors for distance.

The cylindrical effect may be increased for one eye and decreased for the other, as in anisometropia where the lenses are of opposite denomination, or in astigmatism where the direction of one cylinder is widely different from that of the other. With a spherical lens for one eye and a weak cylinder for the other, it is possible that the tilting will give a cylindrical effect to the spherical

lens and wipe out the cylinder in the sphero-cylinder.

Effect of the distance between the eye and the correcting glass

It is usually assumed that an ametropic eye is corrected for distance when the posterior principal focus of the correcting glass coincides with the punctum remotum of the eye. That is to say that, when this has been done, the eye and the lens are the same as an emmetropic eye without a lens. We shall see that this is not exactly so.

It will be seen in figure 2 that since both the principal focus (F) of the lens and the punctum remotum (P.R.) of the eye lie behind the convex lens, the lens will always be weaker than the hyperopia that it corrects, and the weaker it is the farther it must be placed from the eye. No matter how far a convex lens, whose focus coincides with the punctum remotum, is placed before a hyperopic eye an image of a distant object will be formed on the retina. A hyperope increases the corrective power of his glasses for distance by pulling them away from his eyes, and decreases their power by pushing them closer. The effect is in proportion to the strength of the lens, so that with a strong convex lens it may be considerable.* If, with convex lenses, a patient continues to see clearly at a distance when the lenses are pulled away from the eyes it is an indication that he has not been over-corrected.

In myopia the punctum remotum lies in front of the eye; the posterior principal focus (F, figure 2) of the concave correcting lens lies in front of the lens. Here the concave lens that makes parallel rays appear to come from the punctum remotum of the eye must be stronger the further away it is placed from the eye and, therefore, the closer to the punctum remotum. A myope increases the effective power of his correcting glasses by placing them closer to his eyes, and decreases their power by pulling them away. A myope who continues to see clearly when his lenses are pulled away from his eyes is over-corrected.

So far, the assumption that the ametropic eye is corrected for distance when the posterior principal focus coincides with the punctum remotum of the eye is true; but the size of the retinal image is not the same for different positions of the correcting lens—and the size of the retinal image is always an important factor in corrected ametropia, especially in anisometropia.

Before considering the effect on the size of the retinal image of the position of the correcting glass, it might be well to briefly review the principles involved in the calculation of the size of the image in both the static and dynamic eye.

The most frequently proposed method for obtaining the size of the retinal image is by the use of the proportion:

$$\text{size of image} = \frac{\text{distance of nodal point from retina}}{\text{distance of object from nodal point}} \times \text{size of object}$$

But this formula is not practical for our purpose. In the static eye it cannot be applied unless we know the exact length of the eye; in the accommodating eye the changed position of the nodal points must be known.

Take Donders' eye, the simplest of all reduced eyes, in which the posterior principal focus is 15 millimeters behind the nodal point. When this eye is at rest a clear image is formed on the retina only when the object is at infinity. If the object is placed at a finite distance, such as O (figure 5), the image

* This does not ordinarily apply to convex lenses for the correction of near vision in presbyopia. Landolt lays down the rule that in order to adapt an eye to a distance greater than double the focal distance of the convex lens, the latter will need to be weaker in proportion as it is farther removed from the eye. The reverse is true when the distance is less than double the focal distance of the lens. Thus a presbyopic emmetrope, low hyperope, or even myope who pulls his convex glasses away from his eyes in order to read, gets the effect of a weaker glass and must, therefore, be over-corrected. High hyperopes, especially aphakics, increase the effective power of their lenses by pulling them away, even for near vision.

will be formed at I. This will indicate the position of the retina in a myopic eye. The size of the image cannot be found by the above formula unless we know the length of this myopic eye. It is incorrect, in ametropia or in the dynamic eye, to use a constant distance of 15 millimeters from the retina to the nodal point (K). When the length of the eye is the same and the refractive power is increased or decreased, as in accommodation or aphakia, the distance from the retina to the nodal point is changed.

A better proportion for calculating the size of the retinal image is:

$$\text{size of image} = \frac{\text{distance of anterior focus from eye}}{\text{distance of object from anterior focus}} \times \text{size of object}$$

The advantage of this is shown in Fig. 6, where the object is signified by O, the anterior focus of the eye by Φ, and the image by I.

By this method, using a reduced eye, we can quickly find the size of the image for any distance of the object and for any length of the eye. We need only know the distance of the object and the anterior focal distance of the eye. We can also visualize the effect of the correcting glass on the size of the image.

If a line from one extremity of the object coincides with the principal axis of the system, and another line, from the other extremity of the object, crosses in the anterior principal focus of the eye, these lines will be parallel to each other after refraction. The image, therefore, will be the same size regardless of the length of the eye. We are justified in considering all cases of ametropia as axial excepting aphakia. The accommodating eye is considered as refractive myopia the anterior focal distance of which we can easily find in the reduced eye.

When the ametropic correcting glass is so placed that its posterior principal point coincides with the anterior principal focus of the eye, there will be no alteration in the size of the image. The reason is, as we know, that a ray directed toward the first principal point leaves the lens as though it came from the second principal point, and in a direction parallel to its first course. Hence, the direction of the lines that limit the size of the image are unaffected. When the lens is placed behind or in front of the anterior focus the change in the size of the image may be considerable, depending on the distance from the focus and the amount of the refractive error.

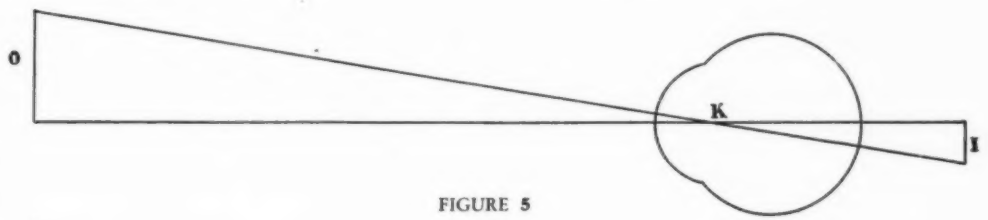


FIGURE 5

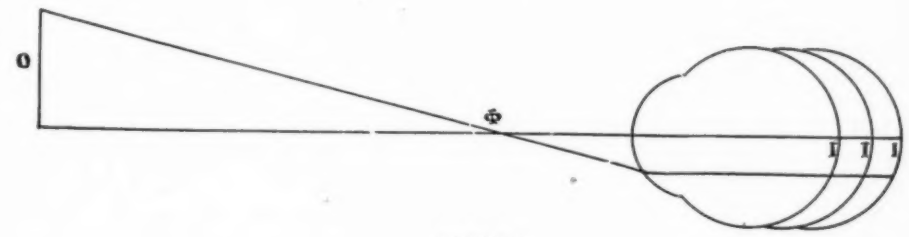


FIGURE 6

Figs. 5 and 6 (Cowan). Accessory effects of the correcting glass by its position before the ametropic eye.

Take, for example, three eyes: an axial myopia of 4 diopters, an emmetropic eye with a +4.28 diopter lens placed so that the principal point coincides with the anterior focus of the eye, and an accommodating emmetropic eye. We shall employ a reduced eye whose anterior focus is 16.5 millimeters in front of the cornea, and an object 25 millimeters in size, placed 250 millimeters in front of the cornea.

In the axial myopia the object is placed at the punctum remotum, a distance of 250—16.5=233.5 millimeters from the anterior focus. Substituting the figures in the formula, we have for the size of the image,

$$I = \frac{25 \times 16.5}{233.5} = 1.76 \text{ mm.}$$

In the emmetropic eye with the properly placed lens before it, the image would be the same size as in the axial myopia—1.76 millimeters—because the lens would render the rays parallel before entering the eye, and they would be imaged on the retina.

Our reduced eye whose focal distance is 16.5 millimeters has a power of 60.6 diopters. Adding the power of 4 diopters for a near point of 250 millimeters gives the accommodating eye a power of 64.6 diopters—a focal distance of 15.47 millimeters. The object is now 250—15.47=234.53 millimeters from the anterior focus. With these values in the formula for the size of the image:

$$I = \frac{25 \times 15.47}{234.53} = 1.64 \text{ mm.}$$

It is thus seen that the image is larger for an object placed at the punctum remotum of an uncorrected myopic eye than it is when the object is placed at the same distance before an accommodating emmetropic eye. If the myopia were corrected for distance with the properly placed concave lens, so that it would be necessary to exert the same amount of accommodation as in the given emmetropic eye, the images for the two eyes would be the same.

In a young anisometrope—one eye emmetropic and the other myopic—the difference between the size of the image of an object placed at 25 centimeters from his accommodating emmetropic eye and the size of the image of an object at the punctum remotum of his myopic eye may be enough to interfere with binocular single vision. In this case a plane glass before the emmetropic eye and the proper glass before the myopic eye, will render the images the same size.

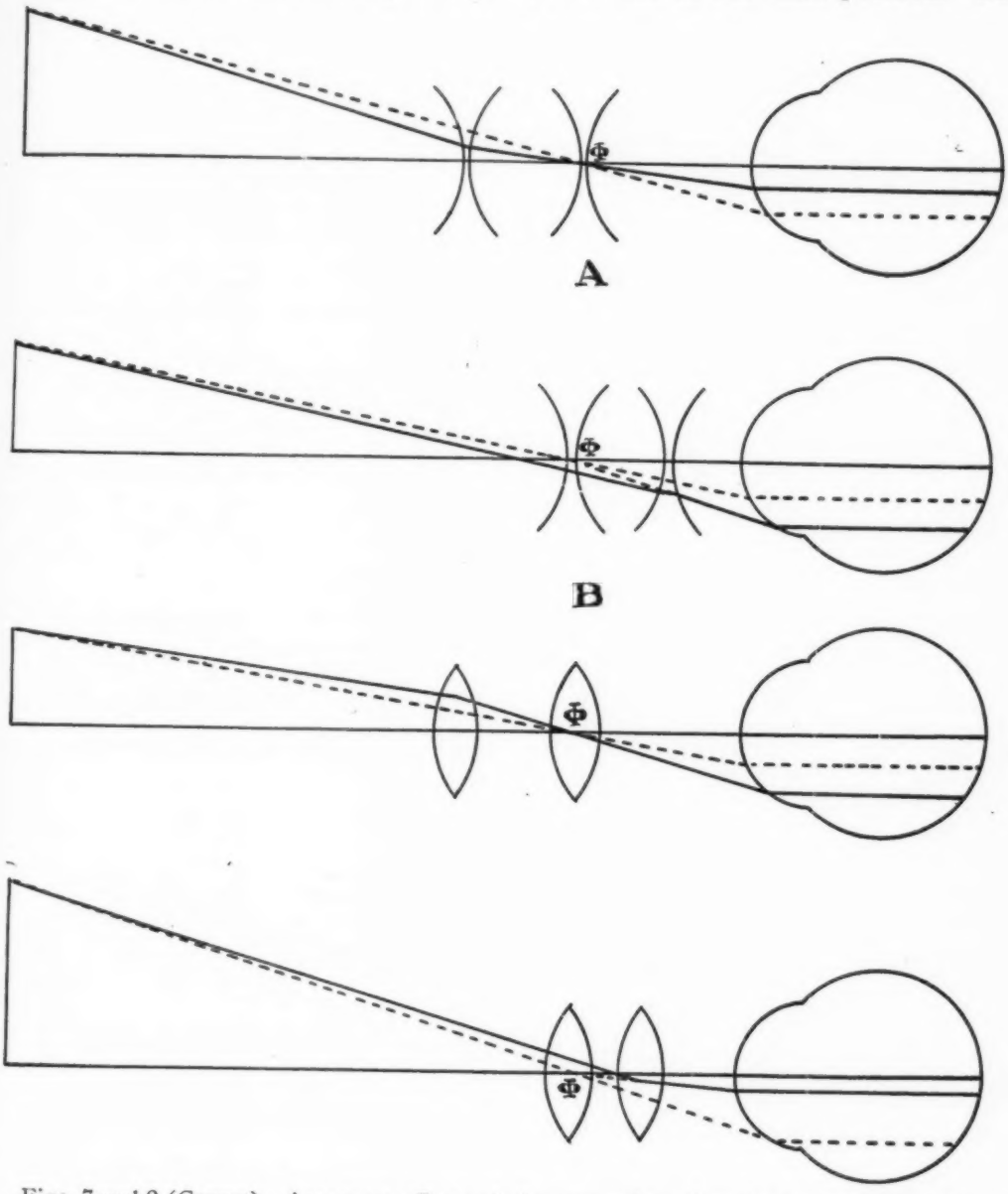
In figure 7 is shown the effect on the size of the retinal image when the concave lens is placed behind or in front of the principal focus of the myopic eye. In A it will be seen that when the lens is in front of the focus of the eye the ray that enters the eye as though it came from its anterior focus will have been made to diverge by the lens. This refracted ray, shown by the solid ray in the diagram, will be closer to the principal axis than the unrefracted ray, shown by the dotted line that passes straight through the lens whose principal point coincides with the anterior focus. The image will be smaller in the myopic than in the emmetropic eye when the correcting lens is placed in front of the anterior focus. When the lens is placed behind the anterior focus, as shown in B by the solid line, the image will be larger than in ametropia.

In myopia of high degree the correcting lens should be placed as close to the eye as possible. By doing this we not only enlarge the retinal image, but the lens will have the same effect as a stronger lens placed farther away from the eye. The largest image with the weakest lens is most desirable in high myopia. In practice the lens is usually placed at a distance of about 12.5 millimeters from the cornea, so that it is usually closer than the anterior focus of the eye, but to obtain the maximum result in extreme cases it might even be of advantage to cut the patient's lashes.

In figure 8 it will be seen that the effect produced by a convex lens placed behind or in front of the anterior focus of the eye is the reverse of that pro-

duced by the concave lens. Here the lens is necessarily weaker and the image larger, the farther the lens is placed in front of the anterior focus of the hyperopic eye.

One of the advantages of a meniscus, and one which seems to have been overlooked, is that its principal point lies in front of the anterior surface, so that it is farther away from the eye than the principal point of a flat lens of the same power and in the same position. On the other hand, the convexo-concave lens has its principal point behind the back surface, making it possible to place the principal point closer to the eye than the lens itself.



Figs. 7 and 8 (Cowan). Accessory effects of the correcting glass by its position before the ametropic eye.

A +4 diopter lens, 3 millimeters

thick, whose index of refraction is 1.52, and with a back surface of —6D., has its posterior principal point about 1.66 millimeters in front of the anterior surface. When this lens is placed with its back surface 12.5 millimeters in front of the cornea its principal point is 17.16 millimeters away and the image is larger than in emmetropia. A biconvex lens of the same thickness, with its back surface in the same position, would have its principal point about 13.5 millimeters in front of the cornea—the image would be smaller than in emmetropia.

A +4 diopter lens, 3 millimeters thick, whose index of refraction is 1.52, and with a black surface of —6D., has its principal point about 0.32 millimeters behind the posterior surface. The advantage of this lens over the flat form is not so great as in the meniscus; nevertheless, when placed with its back surface 12.5 millimeters in front of the cornea the principal point is only 12.18 millimeters away, and the image is larger than in emmetropia.

Where both lenses of a pair of spectacles, of the same denomination and of equal or nearly equal strength, are so adjusted that they are the same distance behind or in front of the anterior focus of the eye, there will be no discomfort to the patient; but where one of the glasses is behind and the other is in front of the anterior focus, the image in one eye will be larger than that of the other.

In astigmatism we must remember that a distortion of the image can be produced by the improper position of the lens, even though the refractive error in each meridian is corrected. For example, a convex cylinder, with its axis horizontal, and placed too far from the eye, may cause enlargement of the image mostly in the vertical meridian and make it appear elongated vertically. The reverse effect will be caused by a concave cylinder.

In mixed astigmatism it is obvious, since the curves are of opposite denomination in the principal meridians, that the lens should be as carefully placed at the anterior focus as possible.

In anisometropia it is necessary to place the lenses so that the principal point of each lens either coincides with the anterior focus, or so that these are equivalent distances apart; both in front or behind when of the same denomination, or one in front and the other behind when of opposite denomination. Here, especially if one lens is convex and the other is concave, when both lenses are too close or too far from the eyes, the image will be magnified in one eye and reduced in the other.

Deeply curved lenses, when one is positive and the other is negative, must be adjusted with extreme care. In these cases will be seen one of the many advantages to be derived from the adjustment of glasses with reference to the front surface instead of the back surface, as proposed by Edward Jackson. Consider, according to Gullstrand, that the anterior principal focus of the eye is 15.7 millimeters in front of the cornea: in such an extreme case as —4D. in one eye and +4D. in the other, the principal point of the positive lens will be 1.4 millimeters in front of, and that of the negative lens 1.5 millimeters behind the anterior focus, if the front surfaces of both lenses are placed 15.5 millimeters in front of the corneas. This is almost perfect. But if both lenses are placed with their back surfaces 12.5 millimeters in front of the corneas the principal point of the convex lens will be 1.4 millimeters in front of, and that of the concave lens 3.5 millimeters behind the anterior focus.

There is no doubt that most of the discomfort experienced by anisometropes is caused by ill fitted glasses. There is no reason, theoretically, when the error is axial in both eyes, why these patients cannot get comfortable binocular vision with glasses. Of course, where the error is axial in one eye and refractive in the other, as in unilateral aphakia, binocular single vision is not to be considered.

1930 Chestnut street

IMPRESSIONS OF THE AMSTERDAM CONGRESS

Thirteenth International Congress of Ophthalmology

Three American members of the Thirteenth International Congress of Ophthalmology describe the gathering from various angles, scientific, personal, and social. While there is naturally some overlapping of these impressions, each writer has selected distinctive details which will be of interest alike to those who did and those who unfortunately did not attend this remarkable assembly.

1.

M. Davidson, M.D.
NEW YORK CITY

Two hundred and sixty papers and demonstrations by almost as many individuals out of over a thousand members representing some forty countries made the Thirteenth International Congress of Ophthalmology a monster rally of science. About four hundred guests, including wives and families, were registered in addition to the ophthalmologists. Australia, Japan, South America, South Africa, India, and Siberia all sent delegations. The member from Siberia came all the way from Yakutsk in the far north, having traveled twelve hundred miles by airplane to reach the nearest railway station, Irkutsk, itself five thousand miles from Amsterdam. Some of the Japanese came across Siberia, others came by way of the Pacific and across America. This gives some idea of the enthusiastic interest the Congress had evoked among ophthalmologists throughout the world.

The warm reception on all sides, by their Majesties the Queen Mother and Queen Wilhelmina, by the Prince Consort; by the Minister of Instruction, Fine Arts, and Science; by the mayors and other dignitaries of the various municipalities visited during magnificently organized excursions to Amsterdam, Rotterdam, Haarlem, the Hague and other places; the well conducted visits to the museums and other famous places of interest; the sumptuous luncheon offered at Rotterdam by the directors of the Rotterdam Drydock Company; the gala concert provided by the municipality of Amsterdam at the Concertgebouw under the leadership of Cornelis Dopper; the vast army of volunteer young lady workers —all these gave to the Congress the atmosphere of an international festival as well as that of a scientific assemblage.

The Dutch ophthalmologists at the Congress were apparently too busy entertaining their visitors to take advantage of their opportunities as ophthalmologists. Their self-effacement in this regard went to the extent of omitting Dutch as one of the official languages of the Congress, and of keeping their well recognized prestige as scientists, their splendid ophthalmic clinics, from obtruding themselves upon the attention of the Congress—a self-sacrifice which called forth universal comment. Only upon the initiative of a group of members was Professor Van der Hoeve prevailed upon to show his clinic at Leyden, which was described by those who had the good fortune to see it as one of the best equipped and most luxuriously appointed eye clinics in Europe.

Our Dutch hosts were, on the other hand, lavish in introducing us to the history and art treasures of their country. Many of us left Holland wiser in art matters, certainly that one of us who asked our guide where Mr. Frans Hals lived in order to have a portrait done by him. The Dutch painter whom none of us will ever forget is the merry Jan Steen, from whose naughty painting in the Rijksmuseum in Amsterdam our hosts selected his sketch alluding to the Dutch proverb: "Wat baet er kaers of bril, als den uil niet sien en wil" (What is the use of candles or spectacles, when the owl does not want to see), for the Congress emblem. The famous factory of Delft porcelain—"De Porcelaine Fles"—made it up into por-

celain, and the silversmiths—"Royal Begeer"—struck out a highly artistic modernistic medal for us. A Dutch scientist of the seventeenth century whom we shall all remember is Antoni van Leeuwenhoek, one of the early microscopists, a film biography of whose life and work, a masterpiece of biologic lore, instructed and entertained us one evening. A living Dutch ophthalmologist who has endeared himself to all is Professor Van der Hoeve, the president of the Congress. In addition to his extraordinary facility in the five official languages of the Congress, in all of which he gave his opening discourse, he seemed to possess an inexhaustible supply of energy and of thoughtful kindness for everyone.

The overwhelming hospitality of the Dutch and the business of the Congress kept us all so steadily occupied that while there was no stinting of private expressions of admiration for the efforts of our hosts little was done in the way of formal gestures of reciprocity. The feelings of the Congress as a whole were of course adequately and eloquently expressed by Mr. Treacher Collins, who displayed, in addition to his well known geniality and brilliancy, a profound familiarity with Dutch history, art, and science. There stood out also that graceful gesture of homage to Holland and to Dutch medicine by the Spanish and Spanish-American ophthalmologists in depositing flowers on the great Boerhaave statue at Leyden and in presenting a copy of Boerhaave's "De morbi oculorum" to the University of Leyden.

Among the groups at the Congress, the Germans were perhaps the most conspicuous—as conspicuous by their presence at this gathering as by their absence at the two previous attempts at international ophthalmological Congresses since the war. Their contributions outnumbered those of all other groups. The French came a close second, followed by the Spaniards. Between these three groups, over half of the papers and demonstrations are accounted for. Considerable contributions were also made by the Americans, English, and Italians. The Russian group was very small, only three members attending, since only those delegated by the government could afford to make the journey.

There was a notable passivity on the part of the older generation of ophthalmologists in the scientific work of the Congress. They were present of course —Fuchs, Axenfeld, Weeks, Gullstrand, Parsons, Barraquer, and others—but, whether because the sessions of the International Council monopolized their attentions, or because of a deliberately concerted policy to give the younger men a chance, their participation was more social than scientific. They were seen in the lobbies mingling freely with the younger men and receiving their devoted homage.

On the whole there seemed a desire to subordinate the scientific work of the Congress to the creation of international good will and cooperation. The greatest share in that work was again accomplished by the Dutch contingent with Van der Hoeve at its head. The political significance attached to the Congress was further illustrated by the great excess of official government delegates over those representing ophthalmological and learned societies and universities, as well as by the Dutch government's eagerness to promote an atmosphere of good fellowship through its official receptions. The political preoccupations were felt by many as a necessary expedient, and, now that the ice has been broken, as Van der Hoeve intimated in his closing address, at the next Congress science is to be stressed and politics subordinated.

The economic problems of ophthalmologists were not overlooked. One of the resolutions read called for measures to retain in the hands of ophthalmologists the practice of refraction as well as the examination of the eyes for the licensing of various occupations, of late encroached upon by nonmedical outsiders.

The scientific program was overcrowded, and the consequent necessity of dividing the Congress into sections precludes any attempt at this time to

evaluate the contribution of the Congress to ophthalmology. The abstracting of so many papers called for much condensation, and their publication in the five official languages of the Congress added difficulties of translation, with the result that the volume of abstracts is totally inadequate to give a clear notion of the work accomplished. The opinion was frequently expressed that too much material already published was allowed on the program.

The public health aspects of trachoma, and the enormous place it occupies in the practice of clinical ophthalmology in those parts of the world where trachoma is prevalent, had been recognized by the International Council in the arrangement of the symposia. The number of speakers assigned to the trachoma symposia was twice that assigned to the other two symposia. Its tremendous importance was further shown by the desire of sixty members to participate in the discussion, forty-five of whom had to be denied that opportunity for lack of time. It is interesting to note that only one paper dealt with the bacteriology of trachoma. That its public health aspect is paramount was demonstrated by the excellent results in combating it by intensive campaigns in many countries, notably as reported by Wibaut of Holland. The latter pointed out, on the basis of his experience in eradicating an imported focus in Amsterdam, that race, climate and rainfall, and social-economic conditions are the most important factors in maintaining it in an endemic form, and that while, for its solution, international cooperation in the direction of pooling of research and experience is necessary, the value of frontier examination of migrants, and the advantage of measures of exclusion against sufferers from trachoma, are much overrated. From conversations with the Russians, I learned that an extremely active campaign against trachoma is being waged by the Soviet government. To give an idea of its trachoma-mindedness (to use an expressive Americanism) I may mention that out of the 222 pages of collected papers by the staff of the Hirschman Memorial Ophthalmic Hospital of Charkov, a copy of which was presented to me by one of the Russian delegates, over one-half is devoted to trachoma and its sequels.

The interest in the various ophthalmologic subjects, to judge from the contributions of the various countries, is unevenly distributed, apart from the one-sidedness already alluded to in connection with trachoma. Thus, refraction and motor anomalies seem to be of greater concern to the North Americans and the Germans, surgery appears as a major preoccupation of the French and the Spaniards, while both the Germans and the French also show great interest in devices for teaching and recording. Both Spain and Germany stress pathological work, while biochemistry and physiology attract most attention in the United States and in England. The medical treatment of cataract, and the relative value of intracapsular versus extracapsular extraction, continue to occupy the minds of ophthalmologists everywhere. The genesis of myopia is still an unsolved problem. A widespread interest was exhibited in glaucoma, and a tendency to regard it as a medical rather than a surgical, a general rather than a local, problem was clearly noted.

Retinal disease came in for a great deal of attention. One little-known entity presented was Oguchi's disease, which consists in a hypersensitiveness to light due to a deficiency of rods and also manifesting itself in a gray appearance of the retinal periphery under light adaptation, the color changing to a normal red on dark adaptation.

The question of detachment of the retina was discussed by four speakers. Gonin's advocacy of ignipuncture was unanimously supported by the experience of Arruga, Perez Bufill, and Weill, and the absence of adverse reports seems to establish its value. Kapuczinski's paper, furthermore, tends to establish Vogt's contention that cystic degeneration of the retina is the primary cause of detachment in both senile and myopic cases, that it is not

due to traction on the retina by adhesions or bands in the vitreous.

Among the apparatus and exhibits of optical instruments there stood out the aids in clinical instruction, such as Elschnig's film showing his cataract operation, the colored film and fundus pictures of Wessely, the poly-ophthalmoscope of Wegner which permits observation of the fundus by the teacher and eight other persons, reflexless photography of the fundus by Hartinger, and stereoscopic photography of Nordensen. Photographic pictures of the corneal surface, highly magnified, were also shown. Beminghoven's anatomic models for educational purposes attracted attention. The perfected contact lenses of Müller and Zeiss, proved by Professor Heine to be so well tolerated and used by him so extensively in the correction of various ametropias as well as in keratoconus, were universally admired. Berens' ergograph and H. Friedenwald's new ophthalmoscope aroused much interest.

The next Congress will be held in Madrid, Spain, in the spring of 1933. The writer was fortunate in having planned and executed a trip to Spain after his attendance in Amsterdam. The friendships made at Amsterdam among Spanish ophthalmologists were followed up in their native country and decidedly worth while visits to their clinics were made at Madrid and Barcelona, in addition to visits to the two expositions at Barcelona and Seville. Spanish hospitality is proverbial, and the Spanish art treasures are too well known not to attract a large attendance in 1933. In view of the fact that the next International Congress of Otolaryngology is also planned for Madrid, in the fall of 1932, it seems to the writer that it would be advantageous to the American contingent, at least, if some arrangement could be made to shift the dates of the two congresses. By bringing the congresses closer together, a larger attendance could be expected from this side of the Atlantic, where the practice of ophthalmology and otolaryngology is frequently combined and the many borderland problems of the two specialties could be more adequately dealt with.

210 West Seventieth street

2.

EDWARD C. ELLETT, M.D., F.A.C.S.
MEMPHIS

The International Ophthalmological Congress held in Amsterdam on September fifth to thirteenth has passed into history, and will be long remembered for the scientific value of its proceedings, as well as for the fact that it was the first effort to renew the series of similar congresses interrupted by the World War. That the effect was successful is most gratifying, and already plans are on foot to hold the next one in Madrid in 1933.

In speaking of the Congress, one can speak first of the general arrangements. The registration booth was served by a group of very attractive Dutch girls who apparently spoke all the modern languages, and answered our many questions patiently and intelligently. Each member of the Congress had a numbered box in which all communications, announcements, and other matters were placed. The commercial exhibits were located in rooms to one side of the registration desk, and so close to it and to the meeting hall that if one had ten minutes to spare he could visit some of the beautiful displays of books, instruments, and appliances. The meeting hall in the Colonial Institute served for the demonstration sessions and for the symposia. It was a large hall with windows whose shades were simultaneously and quickly raised or lowered by central motor control, so that the hall could be completely darkened in about five seconds. The size of the hall and the high ceiling made it

very comfortable as regards ventilation, and a "no smoking" rule added greatly to the comfort of those who sat through the sessions. The arrangements for showing illustrations, both opaque and transparent, as well as moving pictures, were perfect.

The conduct of the sessions left much to be desired. Announcements of arrangements and the like were usually made by the president of the Congress, Dr. Van der Hoeve, in at least four languages. To him and to the secretary, Dr. Marx, too much praise can not be given. But the chairmen of the respective sessions announced the speakers by their last names only, without saying where they were from or upon what subject they would speak, whether they were to discuss the last paper or to introduce a new subject, and the name was usually mentioned in a low tone before the applause for the last speaker had subsided. After the first session a blackboard was installed in the main hall, but not in all of the smaller ones, nor at all when the Congress moved to Scheveningen, so that it was too frequently quite difficult to follow the proceedings. A volume of excellent abstracts of the papers in three or four languages was a great help, but gave no assistance when it came to discussions.

After the first session, which was given over to demonstration of instruments, the Congress worked in sections, so that one could only attend part of it, and one can only speak of the part which he was fortunate enough to hear. The social features are being described by others, and it need only be said now that the hospitality and entertainment that were offered were of the inspired variety that leaves the guest free to choose what he prefers to do and to see, without embarrassing him with attention on the one hand, or giving him any reason to feel that he is neglected or not well looked after on the other. Our hosts were constantly in evidence through their thoughtful contributions to our comfort and pleasure, and never in the foreground in person. Official notice of our presence was sufficient to make us feel that we were very welcome and that all of Holland joined in greeting us and making us feel that our coming was most acceptable to her people.

One must have been struck with the absence of certain subjects from the program. There was nothing on focal infection or on foreign protein therapy. The slit-lamp was mentioned but once, the relation of eye disease to nasal affections was considered in only one paper, and very little was said about tuberculosis. To appreciate what this means one must remember that more than two hundred papers were presented. A good deal was said about photography, color photography, and motion pictures to demonstrate operations and diseases. Not many things of startling newness were mentioned, and many of the contributions were quite "thin" for such an occasion, sometimes not much more than the report of a case. A good many of the contributions were far from being new matter to anyone who has even casually followed the literature.

The old reliables, cataract, glaucoma, and trachoma, came in for their share of attention. The discussion on trachoma did not have to do with treatment so much as with the geographical distribution of trachoma, illustrating what a world problem this terrible disease has become. There were some contributions to the etiology of cataract, especially a paper by Burdon-Cooper, but it did not seem to us that we were much nearer the discovery of the cause. The operation was discussed, not so much in a general way as by emphasis on some one step of the operation. The Smith operation was not mentioned. Barraquer showed moving pictures of his method, which was also advocated by Van Lint. Moving pictures were shown by Elschnig and Poyales, and were most interesting. Elschnig wipes the wound with five percent tincture of iodine on completion of the operation, and Poyales sews the lids together with one suture to assure closure of the eye after paralyzing the lids. If we could have over-

come the stage fright from which we suffer on such occasions, we might have mentioned Gill's suggestion of closing the lids with a drop of collodion on the ends of the lashes, a simple and effective plan for this particular purpose. Separate mention is purposely made of the wonderful colored motion pictures shown by Wessely of Munich, illustrating various eye operations. This showing was repeated by request, and was followed by general surgical and anatomical films, in colors, which were startlingly lifelike.

The trend in cataract operations was rather definitely indicated, and in the light of this Congress one might speak of the "modern cataract operation" as being an extraction in the capsule, with a peripheral iridectomy and suture of the conjunctival flap. The lids are usually paralyzed by injection of novocain according to the method of Van Lint. A few operators are said to use O'Brien's method of injecting the branches of the facial as it crosses the temporo-maxillary joint, but this was not mentioned at the meeting. A deep orbital injection into the neighborhood of the ciliary ganglion is commonly practiced, the needle being thrust through the lid and not through the conjunctiva as we usually do it in this country. Imre of Budapest objects to both of these steps. He does not like the orbital injection for fear of hemorrhage, and he does not like paralysis of the lids because the patient has difficulty in closing them under the dressing. Other steps favored by some speakers were superior rectus fixation and the use of the speculum rather than lid elevators.

In regard to glaucoma it might be said that there was nothing specially new. The cause and medical treatment were discussed by Duke-Elder, Magitot, and others, mainly along the lines of their already published work, and, while the advantages of careful general examination and treatment were often mentioned, it was as often stated that the present condition of our knowledge does not justify us in supplanting or postponing surgical treatment for any other method. As regards operations, iridotasis and cyclodialysis were not mentioned. Lagrange's operation found many advocates, and there is a tendency to modify the Elliot operation by incomplete trephining, or by replacing the trephining with galvanopuncture at the limbus. The danger of late infection after the Elliot operation was frequently mentioned.

An interesting session was devoted to suprasellar tumors, and another to retinal detachment. The feature of the latter was Gonin's advocacy of ignipuncture. He did not give his technique, but he depends on locating holes in the retina, and by cauterizing them secures firm reattachment. He claims sixty per cent of successes in recent cases. Others spoke favorably but less enthusiastically of the treatment. In conversation with Meller on the subject he said he always advised it, since it was the only treatment he had seen do any good, but he had many failures. Gonin withdraws the subretinal fluid by puncturing the sclera with a knife, and introduces the cautery through this puncture. Meller and others do the whole thing with the electric cautery.

Exchange building

3.

M. HAYWARD POST, M.D., F.A.C.S.
SAINT LOUIS

The Thirteenth International Congress of Ophthalmology, which met in Amsterdam and Scheveningen from Thursday, September fifth, until the evening of Friday, September thirteenth, demonstrates well that the enjoyment of an occasion is far from past with its conclusion. Many delight-

ful incidents keep constantly crowding back upon the mind.

Much has already been written with regard to the scientific aspects of this Congress, and the papers read there will shortly be available to all interested. One cannot avoid mentioning, however, the excellent symposium on glaucoma which took place Friday afternoon, September sixth. Messieurs Duke-Elder (London), Hagen (Oslo), Magitot (Paris), and Wessely (München) led the discussion. Of equal interest was the symposium on trachoma Monday morning, September ninth, participated in by Messieurs Grönholm (Helsingfors), von Grosz (Budapest), Maggiore (Sassari), Mijashita (Tokio), Sobhy Bey (Cairo), Soria (Barcelona), and Wibaut (Amsterdam). In preparation for this meeting a vast amount of literature was presented to each delegate.

A discussion of detachment of the retina, participated in by Professor Kapuszinski (Posnan) and Doctors H. Arruga (Barcelona), Gonin (Lausanne), and Perez Bufill (Barcelona), aroused keen interest and became a frequent topic of conversation thereafter.

On Thursday afternoon, September fourteenth, Dr. Cushing, as a guest of the Congress, opened the symposium on diagnostics of suprasellar tumors with an excellent paper entitled "The chiasmal syndrome", delivered in his usual charming manner. The occasion, however, was somewhat disappointing to the English speaking ophthalmologists because of the absence of Mr. Gordon Holmes, who was also to have read a paper at this time. Dr. Christiansen (Copenhagen) and Professor Ludo van Bogaert (Brussels) also presented papers on this occasion.

Finally, on Saturday morning an important meeting was held in the interest of an International Society for the Prevention of Blindness. Among our own representatives at this meeting were Dr. F. Park Lewis and Mr. Carris.

The worst criticism that might be made of the Congress was the inevitable confusion that arose from the presentation of approximately two hundred and fifty papers in the short period during which the Congress met. On several days it was necessary to hold three separate sessions at the same time, as a result of which much time was spent by the listeners in hastening from one hall to another in an attempt to hear those papers in which each one was especially interested. The halls of the Kolonial Institut, however, while located in different buildings, were all situated in the same park at no great distance from one another.

The members of the Congress were scattered about through the principal hotels of Amsterdam, and in their honor numerous flags of all nations were flying from hotels and buildings all over the city. One house in particular, situated on one of the principal squares and arising directly from the canal, looked most international with Dutch, British, Japanese, French, German, American and various other flags flying from its numerous gables.

The government made every effort to show a deep appreciation of the importance of the occasion. The Congress was opened by the Queen Mother in a few words of greeting spoken first in Dutch and then in French. Again on Monday evening, September ninth, a truly regal reception was extended to all members of the Congress and their families by the Queen and Prince Consort. Unfortunately, due to illness, the Queen herself was unable to be present. The royal palace in Amsterdam, no longer used as a residence by the royal family, was especially decorated and arranged for the occasion.

Owing to a slight misadventure, a dinner party which we were attending earlier in the evening was somewhat delayed, so it was nine o'clock before we could get a taxi to take us from our hotel to the palace. Previous to this time it had been my amazement that so much cleanliness and industry as this country exhibits should be accomplished with so little rush and confusion, but on this occasion we were to see that in case of need considerable speed could be developed. I have seldom had a more rapid or exciting

automobile ride, one accomplished, however, entirely without accident. But people fled in all directions before our onrush. It was evident that the taxi driver did not intend that we should be so late as to be denied admittance.

As it was, we arrived just five minutes after the hour appointed, and were practically the last guests to be admitted to the palace. The building had been transformed in almost a fairy manner. It was without electric light of any sort, but literally thousands of candles and oil lamps in candelabras and suspended in great crystal chandeliers from the ceiling created a blaze of light. The central hall was cleared for the reception of the guests and at the time of our arrival was well filled with a company that presented many points of interest.

The gentlemen of the household were in full court dress and many of the guests appeared in picturesque and interesting array. Some of the ophthalmologists wore military honors and costumes and carried out their implication in charming, courtly manners. About the central hall extended four long corridors, down the center of each of which were long tables on which stood vases of immense, gorgeous flowers such as Holland produces in marvellous luxuriance. Delicacies both for eating and drinking, from all portions of the globe, were also to be found in lavish profusion. Shortly after our entrance, the Prince Consort arrived with his escort and received us all most graciously.

The next evening the Queen Mother entertained two hundred of the delegates at her residence in a most pleasant, informal manner.

On Sunday the Congress adjourned for the day and five excursions were arranged to various neighboring points of interest at the expense of the hosts of the occasion. Volendam, Marken, Enkhuysen, Hoorn, and other places of interest were visited. Travel was by rail, canal, and motor bus. A few private trips also were arranged by those who wished to go in smaller groups. It is possible that some also went by bicycle, but this I can not vouch for. I can only say that it is reported that there are seven to eight million people in Holland and about five million bicycles, a statement which I am quite willing to credit. The bicycles were literally everywhere, and we must have seen two million of them at least that Sunday afternoon.

Similar excursions were indulged in on Wednesday, when the Congress adjourned from Amsterdam to Scheveningen. On this occasion four different trips were arranged, any one of which the members of the Congress might choose to follow in making the journey from Amsterdam to the famous watering place. We joined the second of these, going on a delightful trip through one of the grand canals to Leyden, where a new government hospital was visited. This consists of a group of beautiful buildings situated in a most attractive park contiguous to the railroad station, and intended for the use of all the surrounding country.

The eye clinic was to have its formal opening the day following our visit. It stirred pangs of jealousy in the hearts of many of the beholders. It represented the ultramodern in ophthalmic hospital equipment, with an imposing array of instruments of precision conveniently arranged. Good work and the best of results should certainly come from such excellent facilities.

The old University of Leyden was very human with its scrawls of caricatures drawn on the walls by the generations of students that had passed through it.

On the evening of our arrival at Scheveningen, a reception on behalf of the government was held by the Minister of Instruction in the Arts and Sciences, at the famous old Ridderzaal Binnenhof. On Friday night, the high point socially of the meeting was reached in a grand banquet held in the Kurhall at Scheveningen. This lasted well into the night, course following course, each accompanied by its proper potation. This occasion, like many

others, gave the opportunity for good fellowship and international amity. Our table was probably a fair example. To my left sat a group of Americans; just beyond the neighbor on my right were three representatives of Dr. Krückmann's clinic in Berlin, next to them a representative from Paris, and beyond him a group of Englishmen and their wives.

This banquet was the occasion for several short speeches by the representatives of the various nations, the delightful presiding officer, Professor Van der Hoeve, again showing his ability to talk to most of us in our own tongues. One cannot close without bearing testimony to the very great value, not only to the scientific dignity of the meeting, but to the friendly atmosphere and the cordial feeling, of this gentleman's personal charm throughout the entire occasion. Nor should one overlook the excellent preliminary work that was done by his Dutch colleagues, Mulock-Houwer, Marx, Rochat, Roelofsz (treasurer), Zeeman (secretary), Vattier-Kraane and many others.

Metropolitan building

REMOVAL OF LEAD SHOT FROM THE VITREOUS

GEORGE H. CROSS, M.D.
CHESTER, PENNSYLVANIA

After determining the localization within the eyeball by means of x-ray plates, removal of the lead shot should be attempted as soon as possible, using special forceps carried through a scleral incision, and with the cooperation of an expert fluoroscope operator. Excellent vision may be obtained. Several cases are reported. Read before the American Academy of Ophthalmology and Otolaryngology, October 21 to 25, 1929.

My object in presenting this paper is to show that an eye which has a lead shot in it can be saved, the shot successfully removed, and that so far, in one case of four operated upon, the patient recovered 20/20 vision following removal, by means of the wire loop shot forceps and a double plane fluoroscope, of a number eight shot from the vitreous.

In the last five years I have been fortunate enough to see nine cases, within a radius of fifty miles from Chester, Pennsylvania, each one having been shot in one eye with a lead shot varying in size from a number eight to a BB shot number two. Dr. E. C. Ellett of Memphis, Tennessee, reported a series of thirty-seven cases from 1900-1926, which were shot in one or both eyes with various sizes of lead shot. One's imagination can conjure the number of cases that occur in the United States, many of whom should be given the opportunity to save the eye and retain its vision.

In June, 1927, the first successful removal of a number six lead shot from within the eyeball by this method was reported by the author in a paper read before the American Ophthalmological Society. The successful result in this case, as to the saving of the eyeball, was marred by the poor vision, both before and after the operation, namely, light perception.

In our endeavor to save eyes and vision, the first problem to solve when a case is presented with a number six or eight shot in the globe, is shall we operate and attempt the removal of the shot or shall we be more conservative, take a chance, and allow the foreign body to remain in the globe. The answer is that the operation should be attempted as quickly as possible after the injury, before the formation of exudate makes it more difficult, as we now have a method by which we can successfully remove lead shot from the interior of the globe, with preservation of vision.

Before the section on ophthalmology of the American Medical Association in 1926, Dr. A. E. Bulson, Jr., presented a paper on "Tolerance to foreign bodies within the posterior segment of the

eye". This paper involved a great deal of investigation, as there are forty-one references to the reports and observation of various authorities in the text and excellent discussions of the paper. This paper deals with both magnetic and nonmagnetic foreign bodies. The first conclusion is in part as follows: "It is assumed that in the majority of cases loss of vision as well as loss of the eyeball is due to inflammatory, degenerative, and structural changes brought about directly or indirectly by the trauma and infection, etc".

Dr. Ancil Martin in discussion said: "A foreign body in the vitreous is a critical injury. If nonmagnetic, extraction is always difficult and frequently impossible. It may result in vitreous abscess, plastic inflammation, degenerative iridocyclitis, detached retina, or phthisis bulbi, causing destruction of the eye".

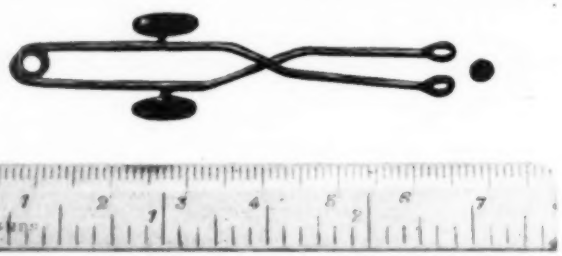
Dr. E. C. Ellett presented a paper before the American Ophthalmological Society, June, 1927, on "Wounds of the eye by projectiles of small caliber and low velocity", in which, in speaking of wounds of the eyeball with retention of the foreign body, he made the following statement: "Such an eye is almost always lost as an organ of vision, and even more in the case of through and through wounds is it apt to pass into a state of chronic inflammation. The situation is complicated by the fact that the small shot are not magnetic and offer only the slightest hope of removal".

The odds are against us before the case reaches our hands. Nevertheless, if these cases can be treated early and promptly we can prevent many of the sequelæ and the loss of the eye, while in some instances it will be possible to save useful vision.

The most important essential point to establish before undertaking this operation is the exact location of the shot. Is it in the globe, or has it penetrated the posterior sclera and lodged in the orbital tissue, or has it entered the orbital tissue by following around the sclera?

Even with modern devices it is quite difficult to localize a foreign body within two to three millimeters. This error is sufficient to place the shot either in or out of the eyeball, when in close proximity to the sclera.

In one instance in Dr. C. E. G. Shannon's case, after accurate localization of a small bird shot which was established as in the vitreous, very close to the sclera, the shot forceps were placed directly over the shot, through a scleral incision, and, when directed by the fluoroscopic operator, Dr. Willis F. Manges, to move straight down, I could feel the resistance of the sclera and the shot was seen in the fluoroscopic plate to be just beyond the tip of the instrument, and to move ahead of the forceps; demonstrating that the shot was not in the vitreous but had gone through the eyeball and was buried in the orbital tissues, closely against the sclera. I withdrew the forceps and sutured the conjunctiva, and the shot was allowed to remain in the orbit. There were no untoward results following the operation.



Forceps used in removal of shot from vitreous (Cross).

In case number eight, in which the lead shot, a BB, was in the orbital tissue right up against the sclera, we adopted a further aid in localization

which was of great assistance. Holding the tip of the forceps to the side and outside the eye, it was possible on looking into the fluoroscope to line them up so that an idea of the location of the shot in the horizontal plane could be marked (by touching a spot of mercurochrome on the skin), then by holding the forceps over the eye, with the fluoroscope again lining up the tip of the forceps with the shot, the position of the shot in the vertical plane could be marked. With the lights turned on, it was possible to approximate the position of the shot. Feeling that the shot in this case was in the orbit close to the globe, I opened the eyelids and, using the closed tip of the forceps as a probe, was enabled to enter the wound of entrance in the conjunctival cul-de-sac and then, expanding the forceps, to push the tissues aside and get a glimpse of the shot. The forceps were allowed to close and the shot was removed without any difficulty.

Case reports

November 12, 1924, Mr. J. W., aged seventy-one years, was shot in the left eye while rabbit hunting. He was admitted to the Chester hospital, November 12, 1924. For this case I devised an instrument and tried to remove the shot through a scleral incision, with the help of the roentgenologist. Using an ordinary fluoroscope, of only one position, an attempt was made to get under the shot and lift it out with a single ring, bent the size and shape of the shot and fashioned on the end of a needle. We were unsuccessful in our attempt, and later it became necessary to remove the eyeball.

The experience in this case demonstrated the necessity of making all instruments to be used in conjunction with a fluoroscopic plate short, as the space between the eyeball and the plate, of necessity, has to be narrow to permit seeing a shadow on the plate. Long instruments run the risk of being accidentally touched and so damaging the internal structures of the eye, at the same time producing pain and upsetting the patient, which greatly increases our difficulties.

The next case, also in a rabbit hunter, seen November 12, 1926, was referred by Dr. C. I. Stiteler, my colleague on the Chester Hospital staff. This was the case presented before the American Ophthalmological Society in Quebec, June, 1927. It was for this case that the instrument and method now adopted for the removal of lead shot were devised. In this effort I was most fortunate in having the skillful assistance of Dr. Willis F. Manges, who so dexterously managed the double-plane fluoroscope. This was a most important factor which contributed largely to our success. Following the removal of the number six shot in this case, four other cases were operated upon. In two cases the shot was found in the orbit, in one the shot was removed, in the other it was allowed to remain in the orbital tissues. In both of the two cases in which the number eight shot was in the vitreous, it was successfully removed. One of these had a detachment of the retina, while in the other we were able to obtain 20/20 or normal vision.

The third case in this series in which a number eight lead shot was definitely located in the vitreous was case number five. Miss C. G., aged nineteen years, was struck in the face with a number of bird shot of number eight size, on August 1, 1928. One shot penetrated the right eyeball at the seven o'clock position on the limbus corneæ, just missing the crystalline lens. The localization was ten millimeters back, eight millimeters below, and two millimeters to the temporal side. The patient was removed to the Jefferson hospital the next day, when with the very able assistance of Dr. J. Farrell, who operated the double-plane fluoroscope, I was successful in removing the imbedded shot with the wire loop shot forceps through an incision in the lower quadrant of the sclera. This patient had a detachment of the retina which prevented a good visual result. This was a keen disappointment, as the outward appearance was excellent and the

eye had quieted down very promptly.

In the fourth case, like the first two, the patient was hunting rabbits when he was shot by another hunter, November 15, 1928. Mr. E. W. MacL., aged twenty-four years, was referred by Dr. J. Milton Griscom. Due to various complications the attempt at removal of the number eight shot from the vitreous of the right eye was not made until November 21, six days after the accident. Dr. Manges again took charge of the double-plane fluoroscope and, after the usual preliminary observations to demonstrate our ability to see the shot in the plate, an incision was made in the sclera close to the localization. After several attempts at removal, and being assured by Dr. Manges in each instance that the shot was in the grasp of the forceps, on withdrawal the shot would spring out of the forceps. We then discovered that we were grasping the shot while encased in exudate. Finally we got a firm hold of the shot and it was withdrawn. The sclera was sutured in the usual manner, atropin instilled, and the eye bandaged. This case demonstrated the disadvantage of late operation. However, I am pleased to report that on January 3, just twelve days after the operation, the vision was 20/20 minus two letters, and it has improved since that time.

The last case with a lead shot in the vitreous makes a total of five. Mr. L. T., aged thirty-eight years, came from Reading, Pennsylvania. He also was rabbit hunting when shot November 3, 1928. It is a coincidence that four out of five cases were shot while hunting rabbits. No attempt was made by his physician to remove the shot. I saw him for the first time, April 6, 1929, when his eye was a shrunken, quadrate globe, tender to touch, quite easily irritated, with the pellet of shot still inside. All that I could do in his case was to advise enucleation. He was too late.

525 Welsh street

GASEOUS EROSION OF THE CORNEA

A. G. WILDE, M.D., F.A.C.S.
JACKSON, MISSISSIPPI

The cornea was denuded of its epithelium by backfiring from a defective cartridge. Visually and anatomically, the condition returned to normal in the course of two days. The corneal trauma is attributed to the mechanical impact of the explosion gases.

The case of "superficial necrosis of the entire corneal surfaces after gas explosion: complete regeneration" as reported by Dr. Burton Chance in the American Journal of Ophthalmology for April, 1929, has much in common with the following, and both serve to demonstrate several factors:

(1) While the epithelial layer of the cornea appears on section to be closely attached to Bowman's membrane, it can be readily separated by trauma, exudates, superficial infection, or postmortem changes.

(2) This epithelial layer can regenerate after injury of apparently severe proportions. Being but the corneal layer of the conjunctiva, new growth proceeds readily from the limbus.

(3) The cornea can resist infection even when deprived of its epithelial covering, and after repair no scar remains provided the injury does not penetrate Bowman's membrane.

(4) When cleanliness has been attained, the corneal epithelium regenerates readily under cover of the immobilized lids, further treatment being of minor consequence.

Case: First lieutenant H. M. W., Twelfth Cavalry, reported November 19, 1929, on account of an injury to the left eye.

While at rifle practice, there occurred a sudden flare-back of hot gases that issued at great velocity around the base of the firing bolt. As he was shooting from the left shoulder, that

eye was open. The projectile left the gun and scored a hit on the target. He experienced sudden and severe pain in the eye, and it became instantly blinded. After receiving first aid, he was transferred by airplane to Fort Sam Houston for treatment.

Examination: The right eye was normal. The entire glabella was thickly studded with yellowish brown particles that came away readily when rubbed with ether, but left the surface sufficiently abraded to cause slight bleeding.

The left lids were slightly swollen by superficial edema, but there was neither erythema nor vesication. The lashes were entirely normal and the conjunctiva unchanged. Embedded in the sclera were several coarse yellowish particles that could be picked out with a small forceps. The entire corneal epithelium, with the exception of a narrow strip adjacent to the limbus, was missing, the area of defect taking a brilliant stain with fluorescin.

There was severe pain, with the usual photophobia, lacrimation, and blepharospasm. No evidence could be found of other injury to the cornea. The tension remained normal, the pupil reacted quickly to light, and the iris was uninjured. The lens was clear and the slit-lamp showed no form of exudate in either aqueous or vitreous.

Treatment: After all visible particles had been removed from the skin and sclera, the conjunctival sac was copiously flushed with boric acid solution. Several drops of five per cent protargol were instilled and retained for three minutes, in order to sterilize the area as much as practicable. Both upper and lower sacs were then filled with sterile vaseline, and the lids were immobilized under a large pledget of cotton and a firm bandage. This was removed daily, the eye cleansed of mucus, and the lubricating layer of vaseline renewed.

The cornea remained clear, and the epithelium was regenerated so rapidly that after two days there was no further staining by fluorescin. No changes could be detected in the corneal substance, either grossly or by slit-lamp. The vision returned to normal immediately.

Comment: While neither the lesion nor its outcome presents anything startling, the question naturally arises as to the cause of the damage. Dr. Chance, in the case previously referred to, speaks of somewhat similar lesions having been produced by a jet of steam, or by compressed air. To explain the present instance three possibilities are available: (1) Direct burn from the heated gases. This seems rather unlikely, as the lashes remained undamaged, and the lids did not display even slight erythema. Furthermore there was no subsequent sloughing such as is usually seen following burns. (2) The loss of substance might arise from irritating products of combustion, that is, might be entirely chemical in origin. While this is more likely than the first explanation, it is again difficult to see how the change could be produced so quickly, and the lesion at the same time be limited to the corneal surface. The absence of slough again seems to rule out chemical action. (3) Mechanical effects of the gaseous blast impinging directly upon the cornea. This was probably the causative factor.

The ammunition employed had been manufactured as a war product during 1918, the fetish of economy requiring it to be still used. At the instant of explosion, there is developed in the firing chamber of the Springfield rifle a sudden pressure of 52,000 pounds to the square inch. This instantaneous release of energy suffices to propel the projectile at a speed of 2,600 feet a second as it leaves the muzzle, and will cause it to pentrate thirty-two inches of seasoned oak against the grain.

The gases generated consist principally of carbon dioxide, carbon monoxide, water, hydrogen, and nitrogen, the mixture being raised to a very high temperature. If the shell fits snugly in the firing chamber, the walls of the latter will assist in withstanding any ordinary pressure, and the likelihood of the explosion gases being projected

backward is so small as to be almost negligible. This assumes that the bore of the rifle is clear or that it can be made so by propelling the projectile forward.

As the cartridge employed was defective, being too small to completely fill the firing chamber, sufficient space remained for the rapidly expanding gases to split it. A slit was found in the wall, extending a short distance across its base. As the exit posteriorly was shorter and more open, the gases followed that course.

When issuing from a small aperture as in the present instance, the force of these expanding gases is sufficient to produce physical injury over a small area and within a short radius. As they are so light, it is evident that their temperature and velocity become rapidly dissipated to zero. As the eye was so close to the vent, the force directed upon the surface of the cornea was sufficient to blow away its epithelial covering, much as the skin of a ripe peach might be ripped off by a sufficiently sudden and powerful blast.

405-407 Standard Life building.

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

November 12, 1929

Dr. H. W. Quales presiding

Intermittent exophthalmos

Dr. T. C. Chapman presented a patient, C.C.D., white male aged forty-eight years, who had been seen for the first time September 28, 1921, complaining that the left eyeball dropped forward on lifting anything or even on leaning forward or when the patient wore a tight collar. The eye was uncomfortable when this occurred and at times quite painful.

Examination showed enophthalmos of the left eye slowly changing to exophthalmos on leaning forward. Finally the left eye was on a plane one-half inch anterior to the plane of the right eye. Otherwise the eyes were normal except for marked physiological cupping of both eyes. Both eyes were straight. Vision of either eye was 20/100, corrected by 2.25 sphere to 20/20.

The speaker had advised the patient against lifting or bending over and against wearing tight collars. When the eye became proptosed the patient was to lie down and apply hot application. Cold applications proved to be of no benefit.

Discussion. Dr. M. B. Seligstein thought an aneurism of an orbital vessel might be responsible.

Dr. E. C. Ellett said that because of its long duration the condition must be of vascular origin, such as dilatation of orbital veins, but was probably not an aneurism because of the absence of bruit, tinnitis, and so on.

Dr. R. O. Rychener thought this might be considered a potential case of voluntary propulsion of the eyeball through relaxation of the check ligaments and recti muscles, as in the case reported by Ferrer.

Dr. Chapman (closing) said that only sixty such cases had been reported, according to Posey. Birch-Hirschfeld had stated that intermittent exophthalmos was due to a varix of orbital veins which might be congenital, but that the venous stasis did not occur until later in life and then under the influence of the mechanical factors to which reference had been made.

Intraocular sarcoma

Dr. J. B. Blue presented Mr. H., aged sixty years, who had been shot in the

right eye twelve years ago. One number six shot perforated the globe. The eye had been entirely blind since, and the nerve head was white. There was an old scar to the nasal side of the disc, several disc diameters away. The shot evidently perforated the globe and wounded the optic nerve. The left eye was enucleated November 5, 1929, for sarcoma of the choroid, a pathological section of which was shown. A simple enucleation had been done.

Discussion. DR. E. C. ELLETT had never seen a local recurrence following enucleation for intraocular sarcoma, and he felt that there was little risk in doing glass ball implantations in these cases. Metastasis into the abdomen was common after enucleation, and he thought the patient was never entirely free from this possibility as he had a case in which abdominal metastasis had caused death eighteen years after enucleation, the diagnosis having been confirmed by pathological examinations. He cited another case in which after enucleation the emissary veins of the globe were found to be filled with sarcoma cells, but in which no local recurrence took place, although the patient lived for thirty years before death from other causes.

Monocular quadrant field defect

DR. J. B. BLUE presented the case of Mr. H., who had been seen November 4, 1929, complaining of loss of upper and outer field of vision in the left eye. Campimetric studies showed defect in the left eye to be quadrant-shaped. Wassermann was negative; x-ray of sinuses showed chronic maxillary sinusitis. This was confirmed by lavage of both antra. Dental examination showed two abscessed teeth which were extracted. Examinations yesterday had shown slight improvement in the defect. The exact cause had not been definitely decided.

Discussion. DR. E. C. ELLETT said the lesion would have to be in front of the chiasm and might be explained by a Jensen's retinitis, but the lesion in such a case should be easily seen by ophthalmoscopy.

Cyst of orbit and anterior cranial fossa

DR. P. M. LEWIS presented a patient having a cyst of the orbit and anterior cranial fossa, probably originating as a cavernous hemangioma. P.T., colored male aged fifty-two years, was seen first in the clinic of the Memphis Eye and Ear Hospital on August 23, 1927. He complained of a swelling of the right eye which he had first noticed in the autumn of 1925. He had practically no pain and his vision was 20/50 in each eye. Examination revealed marked proptosis. Motion of the globe was limited up and out and up and in. A mass could be felt in the upper portion of the orbit. X-ray of the orbit did not show a tumor. X-ray of the nasal sinuses showed the right frontal very indistinct and the antra and ethmoid cells hazy. The sphenoids were clear. The Kahn precipitation test was negative. Except for the limited motion, the globe was normal externally. The vitreous was clear and the fundus was normal. Photographs (exhibited) were made of this man and he was advised to enter the hospital for an exploratory operation and removal of the tumor if possible. General physical examination was negative.

The patient was not seen again until October 15, 1929. The proptosis was now much worse, the cornea and lower bulbar conjunctiva were constantly exposed and the cornea deeply ulcerated. There was no motion of the globe except straight inward, outward, and slightly downward. There was no pulsation and no bruit. The mass in the superior portion of the orbit was easily palpable and seemed to be a soft tumor. Another Kahn test was negative. General physical examination made at the medical clinic of the University of Tennessee was negative. No enlarged glands or evidences of metastasis were found. The patient had lost about thirty pounds in weight since seen in 1927. He had no ataxia, no difficulty with speech, and no paralysis. The patient was given ether as though an extensive operation would be necessary. After an external canthotomy an incision was made through the conjunctiva of the

upper fornix. The tumor mass was almost immediately encountered. It had a bluish appearance and felt soft. The mass was perforated in an attempt to separate it from the orbital tissues, and the contents began to pour out. This was thick and very dark, similar to melted chocolate. About eight ounces were evacuated. After the wall was opened the contained mass was found to pulsate. The cavity was of enormous size, four inches anterposteriorly, three inches vertically, and about two and three-quarters inches laterally. There were no septa present. The walls felt perfectly smooth to the palpating finger. The bone of the cranial floor had apparently been destroyed and the right frontal lobe almost entirely displaced by the cystic mass. The cavity was packed lightly with gauze. The eye was enucleated, as the cornea was completely ulcerated, the lens had been extruded, and vitreous was escaping.

Postoperative notes: The patient's condition was excellent the day following the operation. Then for two days he showed some mental confusion and inability to speak perfectly clearly. There was considerable bloody discharge from the wound, which was kept open with a folded rubber tissue drain. Leucocyte count was 11,000 to 13,000. Temperature was 100.5°F.

Laboratory notes: Smears made from the contents of the cyst showed only blood and degenerated blood cells and a few large bacilli. The latter grew profusely when cultured, and it was felt that they were a contamination and that the contents of the cyst were sterile. X-ray pictures made two days after operation showed the outline of the cyst very clearly in the lateral view, and also in the anteroposterior view. Sections of the cyst wall, taken from the anterior portion, had not yet been reported from the laboratory.

Discussion. Dr. Ellett thought that this had originated as a vascular growth which invaded the posterior wall of the frontal sinus and then by some mechanical means had had its blood supply cut off.

Dr. D. H. Anthony said that a mucocele of the frontal sinus could cause all the pathology encountered in this case.

Dr. Lewis thought it was probably a pulsating hemangioma which had invaded the skull and pushed back the meninges and brain, and then had lost its blood supply.

Intraocular glass foreign body

Dr. P. M. Lewis presented a patient with iridocyclitis from an intraocular foreign body. P.C., negro male aged thirty-two years, was admitted to the eye clinic of the Memphis Eye and Ear Hospital in December, 1928. He complained of continuous pain in the right eye for ten days. The trouble had started when he was struck in the right eye with glass from the breaking of a windshield. The left eye had been blind for eleven years following a blow with a piece of brick.

Examination showed the right eye to have marked ciliary injection, the cornea was hazy, with exudates on its posterior surface, and the aqueous had numerous floating opacities. There was a healing Y-shaped laceration of the inner half of the cornea. The iris was not incarcerated and the pupil was fairly completely dilated with atropin, which the patient had been using since the accident. No glass or other foreign material was discovered. The fundus, seen hazily, was apparently normal. The left pupil was small and fixed. The iris was bound down with posterior synechiæ and could not be dilated with mydriatics. There was no fundus reflex and the eye had no light perception. The vision of the right eye was 5/200. The Kahn precipitation test was negative. The patient was not seen again until May 30, 1929. His eye had been red and sore almost continually but he had simply neglected it. On this date the iris was muddy and was bound down by posterior synechiæ, the cornea was quite hazy, but the tension was normal. The eye was x-rayed for a possible foreign body, but was negative. Atropin, dionin, hot applications, and intramuscular injections of milk were given with little or no improvement. Attention to dental and other possible foci of

infection produced no change. Another Kahn test was negative.

The patient again disappeared and was not seen until the last of September, 1929. At this time vision was reduced to the counting of fingers at three feet and the eye was definitely worse. A small triangular, glistening body was for the first time seen among the numerous deposits on the posterior surface of the cornea. Examination with the slit-lamp showed it to be a particle of glass. It was 2.5 mm. above the lower angle of the anterior chamber. X-ray was again negative.

The man was admitted to the hospital, and on October 4, 1929 the foreign body was removed through a keratome incision. An iridectomy had been done at the same time. The glass was pyramidal in shape and about one millimeter in each of its dimensions.

The chief reason for presenting this patient was to call attention again to the difficulty of discovering glass in an eye. Had examination with the slit-lamp been made earlier, it might have been found before the condition of the eye became so serious.

Discussion. DR. E. C. ELLETT recounted his experience with a similar case in which the glass rested on the iris. He had been surprised at the ease with which the foreign body came away.

Episcleritis

DR. PERCY CONYERS reported a case of episcleritis in a female patient aged fifty-two years. This persisted for nine months and the eye was intensely painful throughout the disease. An interesting feature was the contraction of the pupil which persisted in spite of mydriatics and hot applications. A thorough search for foci of infection was made, the teeth being removed, while a mild pyelitis yielded under treatment.

Discussion. DR. E. C. ELLETT had seen the patient in consultation, and the breaking down of the nodule with some discharge had inclined him to make a diagnosis of tuberculosis. He thought, however, that most of these cases were due to focal infection. Pain was an unusual complication.

R. O. RYCHENER,
Secretary

SAINT LOUIS OPHTHALMIC SOCIETY

October 11, 1929

WILLIAM H. LUEDDE, president

Vernal conjunctivitis

DR. F. E. WOODRUFF said that this rather uncommon disease was characterized by thickening and roughening of the palpebral conjunctiva and at times by changes in the sclerocorneal margin causing here an elevation with a dirty gray color. This, of course, should never be confused with arcus senilis. Peripheral opacities of the cornea might also be present. Little or no annoyance was experienced during the winter months, but during the spring and fall the eyes showed some redness with a tendency to tearing. The itching and photophobia varied greatly in different cases.

Vernal conjunctivitis was first described by Arlt in 1846, though little attention was given this disease until Saemisch again called attention to it in 1876. Meyerhof considered vernal catarrh a hereditary disease, and based his assumption upon his own observations. It has been observed more frequently in males than in females. The upper lids were the most frequent seat of the disease, although the nasal or temporal bulbar conjunctiva might be involved or even the entire cornea might be encircled. In England and France the tarsal type had been more prevalent, while in Italy and other Mediterranean countries the bulbar form had been more frequently observed. The disease appeared in the negro as well as in the white. It presented a definite picture microscopically. It had not yielded readily to treatment, but radium had given more promise of a speedy cure than other local applications.

In the differentiation from trachoma, phlyctenular conjunctivitis, and other forms of conjunctivitis caused by infec-

tious organisms, it was to be noted that vernal conjunctivitis did not produce a scarring similar to that of trachoma, nor did the pericorneal elevations break down as did those in phlyctenular conjunctivitis.

Various observers had claimed that this form of conjunctivitis was due to hypersensitiveness to certain foreign proteins and some of the pollens had been charged with being the disturbing agents. Other observers had tried the allergic skin reactions with a great variety of results. There was no definite reaction in the case reported. Rosica had ascribed vernal conjunctivitis to endocrine imbalance, especially to a deficiency in secretions of the suprarenal.

Regarding the differential diagnosis and pathology, Dr. Woodruff said that the microscope afforded the means for a definite diagnosis. The affected area showed a proliferation of epithelial cells and the presence of lymphoid cells with bands of connective tissue in the large granular bodies found on the conjunctiva.

Discussion. Dr. H. D. Lamb said that Dr. Woodruff's case was particularly interesting, because in its early stages the conjunctival excrescences were strictly limited to the inner end of each upper eyelid and strongly resembled a papilloma of the conjunctiva because of the deep lobation with fingerlike processes, instead of being composed of the large pavement-stone plaques more characteristic of vernal catarrh. When sections made from pieces excised by Dr. Howard were studied, however, the typical histologic structure of vernal catarrh was found.

Dr. Lamb agreed that vernal catarrh had a characteristic microscopic picture, and he described the principal changes as a proliferation of the covering epithelium which formed many downgrowths, and a proliferation of the subepithelial connective tissue which led to development of hyaline bands. The eosinophiles, while not always present, appeared in large numbers in Dr. Woodruff's case. Dr. Lamb stated that vernal catarrh was easily distinguishable from trachoma, with which clinically it was probably most frequently confused.

Dr. Max W. Jacobs spoke of a paper read by Posey about three years ago in which the latter had fully reviewed the subject of vernal conjunctivitis. At that time there was a general discussion, and the most essential facts were brought out. It was agreed that the congenital factor could be ignored. Another factor discussed was the use of radium. When this was used, it might be wise to treat the patient during the winter months, particularly in those cases that had suffered severely during the summer when the disease was at its height. Dr. Jacobs thought this might be a practical point to bear in mind, so that the patient would not suffer doubly with irritation from radium plus irritation from the disease. He stated that at the Washington University dispensary radium was used when the doctors were convinced that they were dealing with vernal conjunctivitis, and he also called attention to the fact that radium was not without danger if an overdose were used.

Dr. B. Y. Alvis stated that he had had an opportunity to observe a considerable number of cases treated with radium, and that it had been the practice in his office for a number of years to use it as a routine. The results had been rather satisfactory in certain cases. He divided them into two groups: (1) the youngster with the typical gray line about the cornea and the washed appearance of the surface of the under lid; and (2) the youngster with some follicle-like granulations under the upper lid. He found that this first type of case, as a rule, was relieved symptomatically almost at once by the use of radium. He also found radium effective in relieving the itching during the summer, and the patient was kept comfortable when the treatment was repeated three or four times during the summer. A few cases had relapses during the second summer, but it was rare to have a relapse during the third summer, since the cases seemed to be nearly all permanently relieved the second summer. The second type was represented by a

case that he had had under observation for the past three years, in which the boy apeared with some small, follicle-like granulations under the upper lid, with considerable irritation. A diagnosis of trachoma was made because of the appearance of the granulations. The lids were treated with grattaged, and at that time the excrescences were found firmer than trachomatous follicles. After a few months the granulations had thickened materially, and the growth continued until the whole under surface was grown up like a mushroom. Radium was used for a long time with no apparent effect. Some three months ago a resection of the tarsus was done and a mucous graft applied, which had apparently checked the disease for a while. Dr. Alvis said that he had seen the patient a few days ago and believed the case would build up all that had been lost in the operation and would probably present a picture very much the same as it had been before.

Dr. Lawrence Post agreed with Dr. Alvis that there were two types of vernal conjunctivitis. The mild type never turned into the severe type of cobblestone appearance of the conjunctiva of the upper lid. Speaking of the mild type, which was more common in his experience, he felt that it was an allergic disease. The eosinophilia, which was characteristic of allergy and which was associated with practically all cases of vernal catarrh, suggested this. It was not always possible to eliminate foreign protein sensitization by skin tests. A method he had found better was to omit certain foods from the diet, as milk or eggs or cereals—one at a time for a two-week period. He had had a number of cases in which the patient had been entirely relieved symptomatically following removal of one of these foods. But objectively there had not been so great an improvement.

Dr. M. H. Post mentioned a case in which the mother had taken the child off of all food except orange juice for a week, with amazing results. Later the same treatment had had no effect. He said that his experience with radium had not been altogether favorable, although he had tried it in almost all of his cases. Some responded and some did not. It had been a practice of Dr. Ewing to remove these papillomatous formations merely to give temporary relief. Dr. Post added that he used fibrolysin daily.

Dr. J. Keller said that during the summer of 1925 he had the opportunity of observing about six or seven cases of vernal conjunctivitis in children at the Alexian Brothers' dispensary. These cases were chiefly of the nonpapillary type, with only slight changes at the limbus but accompanied by severe itching and photophobia. The symptoms were relieved by milk injections, which, however, did not seem to change the appearance of the pathological condition. The child usually discarded the smoked glasses on the day following the injection, and was free from any of the annoying symptoms.

Dr. J. H. Gross said that a number of years ago he had reported two cases of vernal conjunctivitis occurring in brothers, which might have some bearing on the question of heredity. The cases were of the nonpapillary type and had occurred in successive summers. Excision was recommended a great deal before radium had been used much in medicine, but he thought the treatment was extreme because most of the cases got well anyway. The treatment which he found most beneficial, and which gave relief, was the application of ice. This caused the itching to disappear and also reduced the congestion, thus making the eyes feel very much better. Only mild treatment was given, and the boys were instructed to keep out of the sunshine.

Dr. William H. Luedde said that some years ago he had made an extensive investigation of vernal conjunctivitis and had found that heat produced the aggravating symptoms. Allergy had something to do with it; heredity did not count much; and exposure had no influence. Covering with ice did help it. While looking into the question of dissolving scales from the cornea, a book on therapeutics recommended fibrolysin because it increased the lym-

phocytes. Fibrolysin had proved very valuable in relieving the symptoms of vernal conjunctivitis but had not changed the clinical picture. He also stated that while looking into the pathological changes he found this essential fact: the changes which the conjunctival tissue underwent resembled the changes of the skin in reacting to ordinary irritation. There was a deposit of hyaline tissue, apparently a reaction to irritation in the same manner that the skin reacted. It looked to be a defense on the part of the tissue or a sensitization which the skin seemed to be helping. He believed the milk treatment might easily be explained as overcoming some of the sensitization. He mentioned eight or ten cases which he had been able to follow through to complete cessation of the symptoms, and while he did not consider fibrolysin a cure, it relieved the symptoms markedly. Radium acted in the same way. He preferred fibrolysin but would be willing to try radium.

DR. HUGO REIM mentioned the case of a girl who had been treated for six or eight summers without relief except in the winter. At Dr. Luedde's suggestion he treated her with fibrolysin and a little silver nitrate during the summer, all winter, and the following summer, and then she was apparently cured. Since then she had had no symptoms and no apparent pathology.

DR. WOODRUFF, in closing, stated that he had used silver to relieve the symptoms in his case. Since the papillæ were enlarged and there was no infiltration around the corneal margin, he thought there was no possibility of confounding his case with trachoma. Then too, the papillæ were located in the upper and inner angle and did not particularly involve the tarsal area. Dr. Woodruff proposed trying a little more radium to see what happened and further investigating as to food allergy.

GROVER H. POOS,
Editor

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

October 11, 1929

MR. CYRIL H. WALKER, president

Cystic adenoma of the conjunctiva

MR. COLE MARSHALL showed a case and said the adenoma was very freely moveable, like a limpet; in fact the man came because it got over the pupil. Under the idea that it was angioma, Mr. Marshall removed it freely and sectioned it, and he found it to be cystic adenoma.

Pellet in the vitreous

MR. HUMPHRY NEAME showed a man with this condition. There had been a gunshot wound in the eye. He felt that the eye would have to be removed, as it was in a bad mess and looking very angry. As, however, it showed signs of quieting down after a fortnight he allowed it to remain, and the pellet was still visible.

Persistent pupillary membrane

MR. J. D. CARDELL showed a boy who had attended hospital in February, having had a blow in the left eye while wearing his glasses. The glasses were shattered and a wound of the cornea and prolapse of the iris resulted. The prolapse was removed and the eye did well. A few days afterwards he discovered with the slit-lamp a structure in the pupil resembling a cilium implanted in the iris, and a similar structure on a parallel but deeper plane, this also resembling a cilium, though it was improbable that two cilia had become implanted in this way. There had been no inflammation in the eye and the condition had remained stationary.

Discussion. MR. ERNEST CLARKE referred to a reported case of his own in which a cilium was apparently growing in the iris. He had removed the cilium as he had thought, and the eye was normal afterwards, but he now thought the cilium was still there.

MR. NEAME thought two cilia had en-

tered at the same time in Mr. Clarke's case. Bilateral symmetrical hyperplasia of the lower conjunctival fold.

Bilateral symmetrical hyperplasia of the lower conjunctival fold

MR. O. G. MORGAN showed the patient, a surgeon who had been in practice in the West Indies. His eyes had been red off and on for some months, but the condition had not worried him beyond causing irritation. In the lower conjunctival fold was a thick, hard hyperplasia, while on the caruncle were papillary elevations. There were no enlarged glands and the Wassermann was negative.

The diagnosis, the speaker thought, lay between spring catarrh and tubercle. No eosinophiles occurred in the smear examined. After a portion had been removed he intended to have a section made.

Discussion. COL. A. S. J. LISTER thought it was spring catarrh, though he agreed it did not accord with the types seen in England. In hot climates where cold did not alternate with heat, a continuous irritation occurred which was not seen in this country.

Choroiditis with infiltration of the vitreous

DR. SOURASKY showed a patient in whom, instead of there being floating opacities, the whole viterous seemed to be replaced by a dense mass of shrinking tissue. All investigations carried out proved negative, and the question arose whether the dense tissue could be due to the presence of a foreign body. X-ray examination was negative.

Schneiderian cataract

DR. SOURASKY also showed a woman, aged thirty-three years, with this condition. She had severe diabetes. In the published cases the capsule was invaded, but in that now shown the capsule was replaced by a dense layer.

Intraocular foreign body

MISS DOLLAR showed a young woman whose work had to do with induction coils. There was considerable keratitis punctata, which had been increasing. Observers had failed to detect a foreign body; vitreous and fundus seemed normal. The foreign body was nonmagnetic. No help was obtained from the slit-lamp.

Discussion. MR. B. CRIDLAND spoke of a case in which a piece of copper from a percussion cap entered the eye, but without destroying the sight. As he had felt that he could easily remove it he opened the globe and had made what he had thought were successful attempts at removal with sclerotomy forceps, but failed. No keratitis punctata had developed, and he did not know what was the subsequent history of the case.

The cheiroscope

MR. E. E. MADDOX demonstrated this instrument. He said that squint treatment was of good value in selected cases. He pressed the hand into service in the process of educating the eye. The instrument was for use when the squinting eye needed retraining. There were four ways of using it: (1) the covered mirror, (2) the absent mirror, (3) the oblique mirror (4) the vertical mirror. One eye saw the picture, the other saw the pencil which drew it. He regarded the drawing as important. Children tired of looking at the same picture over and over again. Without mental concentration very little good was effected. Full correction of refraction was necessary. Bifocals lessened the accommodation for reading. There should be a long continued occlusion of the fixing eye. It was difficult to know when to operate in a given case. When nonoperative measures were unsuccessful, or required a long time, so as to jeopardize eventually the cooperation between brain and eye, operation was desirable as soon as its inevitability was apparent, quite regardless of the youth of the patient. He had done the operation even on a boy aged eighteen months, and the eye had been good ever since.

Discussion. MR. ERNEST CLARKE asked about the use of the bifocals. As to the methods of occluding the eye, putting a clip over the eye was useless.

He put as a minimum requirement the wearing of a shield during the whole of meal times, and if the mother could extend it an hour after, without too much protest, that was even better.

Mr. Cridland said his best results came from occluding the eye all day long, and his method was to stick the lids together with rubber plaster. That did not allow of peeping round the edges and in a week's time the vision might be improved from 6/60 to 6/6.

Mr. Morgan thought it better to put the eyes straight and start fusion at once. He would start by operation and then use the cheiroscope.

Mr. Maddox, in a short reply, said he only used atropin when the parent's objection to an occluder seemed too great to be overcome. Atropin was only a partial agent, as it only partly obliterated the noxious influence of the brain on the squinting eye. He agreed with Mr. Cridland that occlusion could not be too constant. One child wore complete occlusion for three months and his vision improved from 6/60 to 6/12 by that measure only. There was need for some uniformity of advice on this subject. If parents went to one surgeon and got from him a severe sentence, and, from another got only a light sentence, they naturally preferred the surgeon who gave a light sentence. The best plan was never to have both eyes open at the same time during occlusion, because when both were uncovered the good eye interfered with the other. One could not tell whether one would get fusion until it occurred; all that one could do was to aim at it. There were two kinds of squint, both dating from birth. One was essential squint and such a child could not be educated, as one could not train what was not present. In the other kind which dated from birth one might succeed by training. He agreed with Mr. Morgan that the squint training was much more advantageous after the eyes had been operated upon. Sometimes one had to concede too much to parents as to the use of atropin.

(Reported by H. Dickinson.)

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THE VALUE OF OPHTHALMIC LITERATURE

The growth of medicine compels choice between specialization and ignorance. But the unity and interdependence of all parts of the human body require that he who tests any part shall know something of structure and diseases of all parts. Progressive medicine continually reaches out into other fields of knowledge and endeavor, for new resources to combat disease. Literature is the practical instrument for keeping us in touch with other branches of medicine, and for suggesting what forces outside of medicine may help to give relief and to prolong life in the daily struggle with disease and disability.

Our common medical education gives every branch of our profession a common understanding of structure, function, and liability to disease throughout the body; and confers ability to understand, help, and profit by the achievements of our colleagues who are working in other directions. A broader education in science shows how things known outside of medicine may help to solve practical problems presented daily by patients. For such extension of our knowledge and professional efficiency, literature is the most useful and effective instrument—so important that it should be understood and used by all. For those who do use it, medical literature increases the number of teachers and makes available the experience of colleagues to extend and perfect our knowledge of ophthalmology; and it brings suggestions from other departments of medicine and other branches of science, to help sift and compare what we have learned, and to develop sound judgment.

So important is medical literature to progressive medical education, that the teaching of how to use it must be given a place in the instruction of medical students. Two or three lectures and demonstrations about the kinds of medical literature, and the indices and catalogues that give access to it, might worthily replace the surgical anatomy of Scarpa's triangle, or the appearances of cancer nests, or even the differentia-

tion of heart murmurs. There was a time when the study of medicine began by "reading medicine" with a preceptor; and the knowledge of the literature so gained was not without value when it came to keeping up with recent advances or specializing in practice.

When one chooses to confine his practice to ophthalmology he gives up part of his interest in other branches; and he often must locate where he is the only one engaged in his own line of practice. There are so many medical men who "do not pretend to know anything about the eye", that the one who does must feel himself out of touch with colleagues who can have much interest in their daily work. The only chances that remain for such a one to keep in contact with the thought of colleagues, are to leave work and home for short visits to medical centers, and to resort to the literature through which he can come in contact with the thought and experience of ophthalmologists throughout the world.

Yet the higher value of ophthalmic literature does not begin when the reader sits down, with printed book or journal in his hand, to read what interests him. It begins when the ophthalmologist is induced to observe more closely and record more carefully his first interesting case, because it may be worth reporting; or when for that reason he gives it more thought, or reads up the literature at hand to make sure that the case is unusual, or to learn what really are its important features. Although these notes may never come to publication, they may prove their value when the early symptoms of iritis arise in the same patient, in what may be a recurrent attack; or when the exact notes, drawings, and records of refraction and visual acuity in a case of partial cataract are compared with the conditions in the same eye a year later. The stimulus of anticipating what possible readers of a case report may think and say or may learn from it, has made much good ophthalmic literature; but it has done more in making efficient practitioners and good teachers of ophthalmology.

Edward Jackson.

CLINICIANS AND THE STUDENT

The world's knowledge is increased in many ways. Among the most important are discovery and teaching. To youth belongs discovery; to age, teaching. Especially is this true in medicine. For in no subject does investigation of the new require more time than in medicine, and in the beginning of a practice there is leisure—soon lost as patients increase in number, and, once lost, by most never regained. Routine, conserver of energy but destroyer of originality, seizes the physician in firm grasp and holds him ever tighter and tighter. To be sure many medical advances have come from clinical practice aided by laboratory study but even so the amount of time required to pursue a subject exhaustively is more than most busy practitioners can give. For this reason the particular contribution of the doctor who has acquired a large practice is usually that of teaching, although such busy physicians should not feel that they can have no connection with original work.

The younger man who has leisure for research can be helped by these clinicians in many ways. First and most important by suggestion of problems to be undertaken. It does not follow that the man who needs to have suggestions made as to what problem to study is scarcely likely to solve the problem, because there are many factors in the wise selection of a problem which enter not at all into its solution. Most young doctors are ambitious and enthusiastic to produce original work but do not know how to begin. It is true that occasionally the enthusiasm to work is overshadowed by the eagerness to publish, but a good mentor can exercise a kindly censorship. These students would like to undertake a scientific study but they lack experience to suggest what will probably be fruitful and what sterile. They tend to choose too ambitious subjects. Without practical experience or knowledge of the literature and with only a few months at their disposal they undertake problems that would require a lifetime to solve. They soon see the futility of their effort and abandon it.

Several such failures result in discouragement. Much valuable time and energy have been thrown away on misdirected research.

It is here that the clinician can be of help. Almost every one who has been long in practice has thought of problems which he has hoped to study. He knows the literature and he can estimate the type of research that will be best suited to the individual's ability and the time at his disposal. It is these ideas which he should give to the younger physician, and having given the problem he can be of material help in advising in its progress towards solution. Even if he has no subject to suggest he can outline methods for using the literature to find subjects for research, and can then counsel as to their selection and point out the best approach to the consideration of the subject chosen.

When a wonderful clinical physician who has not been a writer or a teacher dies, we feel the tragedy of the loss to posterity of his personal knowledge. His experience dies with him. But, though not a writer, if he not only has been a teacher of facts but has shown his students the possibilities of discovery and has started some of them on specific problems, his experience will not have died with him while through him indirectly some seed may have been planted which will germinate into a tree of knowledge. *Lawrence Post.*

THE ASSOCIATION FOR RESEARCH IN OPHTHALMOLOGY

After several meetings and much discussion of the possibilities, needs, and feasibility of such an organization, the Association for Research in Ophthalmology has completed its preliminary organization, and proposes to hold its first meeting for one day during the meeting of the American Medical Association in Detroit in June. The day of the meeting will probably be Tuesday the twenty-fourth. The Association is modeled on the similar Association for Research in Neurology. It is proposed to have one meeting a year, for one or two days, and to devote the time to the consideration of one subject, which will be covered from different angles by different contributors.

Between meetings the affairs of the Association are in the hands of an executive committee composed of Drs. Conrad Berens and Alan C. Woods.

The trustees, who are the governing body, are Drs. Arthur J. Bedell, William L. Benedict, William Finnoff, Harry Gradle, Emory Hill and Alan C. Woods.

There is also a larger body known as the Commission, composed of Drs. E. V. L. Brown, F. Phinizy Calhoun, C. A. Clapp, Edward C. Ellett, Allen Greenwood, Thomas B. Holloway, Harvey J. Howard, Edward Jackson, Arnold Knapp, Walter E. Lambert, W. B. Lancaster, S. H. McKee, W. R. Parker, George E. de Schweinitz, W. E. Shahan, F. T. Tooke, F. H. Verhoeff, J. M. Wheeler, W. H. Wilder, W. H. Wilmer, and William Zentmayer. They will occupy the front seats at the sessions, and will question the contributors, either with questions of their own or with questions submitted through them by other members. It is hoped to make the meetings large and all will be invited to attend them, but no discussion will be held except in the form of questions as indicated, addressed to the contributors, who will then in a way defend their reports.

The success of the neurological association is largely responsible for the formation of this association, but no doubt our own proceedings will be developed on somewhat different lines to suit the purpose of the organization, the nature of the problems, and the wishes of the members. Further details will be supplied from time to time by the secretary, Dr. Conrad Berens.

During the Academy meeting at Atlantic City in October, a meeting was held at which "The causes of acute iritis" was selected as the subject for the first conference. A more ambitious subject might have been chosen, but it was thought best to begin on a subject

of much practical and general interest, as well as one which might be worked up in the short time available before the meeting will be held.

The contributors to the program as far as it has been arranged are Drs. Finnoff, Holloway, and Kolmer.

This association does not conflict with or overlap the purposes of any existing organization, and this fact seems to justify the formation of "another society". It promises to be much more than that. *E. C. Ellett.*

LOAN COLLECTIONS OF MICROSCOPIC SLIDES

At last October's meeting of the American Academy of Ophthalmology and Otolaryngology, there was presented a report of the Section on Ophthalmic Pathology which announced a very novel feature. As is well known, the three national ophthalmologic organizations of the United States have been cooperating with the Army Medical Museum for the past eight years, in urging their members to send interesting pathological material to the Museum, where it is sectioned and studied. The donor of the material receives a complete report of the study together with sections and photographs, if desired. As a result, the Museum now has well over six thousand pathological specimens, forming rather more than the nucleus of a well rounded pathological collection. From this material have been selected one hundred carefully studied representative sections which are gathered into a "loan collection", in which are included not only the slides, but also complete clinical and histological descriptions. Through the financial support of the Academy, twelve such loan collections are now available at the Army Medical Museum in Washington, and may be borrowed by any member of any of the three national ophthalmologic organizations. A deposit of twenty-five dollars is required to insure return within two months without breakage. If slides are broken, they will be charged for at the rate of two and a half dollars each; otherwise the deposit will be returned upon return of the collection. Application should be made to the Curator, Army Medical Museum, Washington, D.C.

Harry S. Gradle.

BOOK NOTICES

Experiments on binocular vision; no. 4 of the reports of the Committee upon the Physiology of Vision, Medical Research Council (Great Britain). By N. M. S. Langlands. 69 pages, 34 illustrations. Paper covers, octavo, price two shillings six pence. Published by His Majesty's Stationery Office, London, 1929.

Langlands has brought to the investigation of binocular acuity the mechanical and mathematical training of an officer of the navy, in consequence of which this work is most scientific and thorough. On account of its highly technical nature the paper will appeal no doubt only to those most interested and versed in physiologic optics.

The pamphlet consists of four parts, the first of which is introductory, and presents the fundamental conceptions, a historical summary, and the results of previous experiments performed by the author. In these investigations, which were considered inconclusive owing to an inadequate number of observations, factors of fatigue, lack of practice, and so on, the binocular acuity was measured, using steady, momentary, and instantaneous illumination of dark objects on a bright field for both direct and indirect vision. Illuminated objects on a dark field were also used. In the first instance the object was a silhouette of a ship with two masts and a funnel and a movable object between the masts. For instantaneous flashes, the point of fixation was a faintly illuminated prism between the masts. The second apparatus consisted of three tubes containing small lamps whose light shone through ground-glass apertures in the end. The middle tube was movable towards or from the observer with respect to the wing tubes. In all cases the ob-

server viewed the objects at six meters' distance, and estimated whether the central object was in front of or behind the two lateral objects. The movable object was placed a given number "γ" of millimeters in front of or behind the silhouette (or wing tubes) at random, corresponding to a difference in binocular parallax of η seconds. If A was the number of correct and B the number of incorrect estimations, the position estimation percentage P was calculated by $\frac{A-B}{A+B} \times 100$. If P equals fifty percent, the corresponding value of η is the fifty per cent binocular threshold. If the data are adequate, it is possible from the known values of γ and the corresponding observed values of P to find from probability tables and calculus the most probable value of the fifty per cent threshold. The fifty per cent threshold serves for comparison of binocular acuity determined by different methods.

Studies were also made using Howard's apparatus and Pulfrich's test plates in a stereoscope. A comparison of the results seems to show that sometimes inexperienced observers who have good binocular acuity with the unaided eyes obtain poor results when tested with a stereoscope although with experience the acuity is markedly improved, and it is probable that with improved apparatus and more practice the threshold might be still further lowered.

Part two describes the measurement of binocular and vernier acuity, using an electrical spark of very short duration as the source of illumination. The duration of the discharge was of the order 10^{-7} second, which has the advantage of entirely eliminating the possibility of ocular movements or change of fixation, or movement of the retinal images relative to the mosaics of recipient elements. The bright field apparatus was used, observations being made both with the unaided eyes and the pseudoscope in order to determine the factor of the size of the retinal image in binocular acuity. The pseudoscope was found to double the value of the fifty per cent threshold, but the author believed this to be due to imperfections in the instrument. The general conclusions are that, with practice, a fairly high binocular acuity (fifty per cent threshold of ten seconds for instantaneous illumination, and five seconds for constant) can be attained with infinitesimal periods of illumination. This acuity seems to be due to binocular position and not to the size of the retinal image, as indicated by a detailed analysis of the data derived by varying the size of the movable object. It appears to exist in its finest form when the point of fixation and the objects whose depth difference is perceived are close together. For constant illumination, vernier acuity has the same threshold as binocular acuity, while for instantaneous flashes the vernier threshold is slightly higher.

The third paper deals with the measurements of depth perception for small illuminated disks in a dark field. No attempt was made to eliminate the factors of size of the retinal image, diameter of blur circles, or differences between perspectives in direct and in indirect vision which might give rise to uniocular perception of depth, but rather to remove the binocular positional factor and to measure the effects of the residual factors. Thus observations were made with the unaided eyes, the pseudoscope, the synopter, and an apparatus to investigate stereoscopy by difference of color. The effects of variation of the brightness of the light disks, and of the angular distance between the center and wing disks, and the influence of peripheral stimulation on binocular acuity were also studied.

It is shown that binocular acuity is due to the separation of the two eyes in space; and the magnitude of this acuity measured under these conditions is of the same order as when dark objects are observed against a bright background, or as is determined from observations of the vertical vernier. There is this distinction between observations of small light disks on a dark ground and those of small dark objects on

a light ground. In the former case the conditions of the sensory apparatus are constantly changing, as the movements of the point of fixation bring new parts of the retina into action. In the latter case the eye becomes light adapted, and even for very bright backgrounds a high binocular acuity is obtained, if sufficient time is allowed during each observation for the adaptation level to rise. The change over from cone to rod mechanism occurs at a brightness of 0.0134 millilamberts. As the angular distance between the center and wing disks increases (up to four degrees) the binocular acuity diminishes for a moderately dark-adapted observer in much the same way as the visual acuity decreases. Peripheral stimulation does not improve it.

In part four the effect of the variation of time of action of the light flash on the binocular acuity, with relation to the work of McDougall on the variation of sensation-intensity with the duration of the light flash, is investigated. Using the silhouette apparatus, restricting the pupils of the observer, observations were made when the diameter of the field and the duration of the flash were chosen at random, so that the observer was not aware of any of the conditions. The results of a very large number of observations indicate that there is no gradual improvement in the acuity as the duration of the flash increases from 5 to 500 milliseconds; and there is no considerable variation in the acuity with the variation in the diameter of the field. Under conditions in which the duration of the flash was known to the observer who had acquired experience with this duration, however, it was found that the binocular acuity was nearly constant with durations from 5 to 200 milliseconds, and for greater durations the acuity rose sharply, the position estimation percentage becoming ninety-eight per cent for a duration of two seconds. In further investigations in which the time elapsing between the beginning of the illumination and the reply of the observer was considered, and a comparison of the fifty per cent threshold for each duration of the illumination was made, it was found that the perception of depth varied very little for illuminations of duration between 10^{-7} seconds (instantaneous threshold) and 100 milliseconds. Between 100 and 500 milliseconds there is a sharp rise in acuity, the threshold diminishing from nine to four seconds. Thereafter the acuity gradually improves. For a duration of four seconds the threshold is 2.7 seconds, while for constant illumination the threshold is 2.1 seconds.

It is evident from the above results that the variation of the binocular acuity is dissimilar from that of the variation of the sensation intensity, and that it cannot be explained directly in terms of total sensation. The binocular perception of depth difference involves processes more complex than those of the sensation intensity; the binocular resolving power arises from the synthesis and differentiation of two already elaborated uniocular images.

The marked improvement in the acuity for durations between 100 and 500 milliseconds suggests that the observer may use ocular movements to improve his acuity, when he has time to do so. According to various observers (Myers, Erdmann and Dodge, Huey) the muscular reaction time for light is 162 to 196 milliseconds, but we do not know the effect of the practice factor on the muscular reaction time.

However, it is not likely that the estimations of such fine differences of depth are based on judgments of changes of convergence. It may be that the point of convergence moves until the two retinal images are in the most favorable positions, relative to the mosaic of receptors. This view might receive some support from the occurrence of "glimpses" of high acuity which were noted from time to time in instantaneous measurements of binocular and vernier acuity. Or it may be that the integration and summation of the differentiation of the uniocular perceptions does not begin until the two images move over the retinæ. This might better explain the gradual approach of acuity to "time threshold".

Langlands believes that the so-called physiological processes involved in the passage to the cortex of a momentary or continuous stimulus applied to the receptors, are physical processes—probably simply currents of electrons. The fineness of binocular and vernier acuity measured in these experiments shows that Hering's theory of a contiguous hexagonal retinal mosaic, assuming that the receptors in the fovea are cones and that, for true visual perception, the cone must be directly stimulated by light, and that different parts of the same cone are unable to transmit different directions in space, must be modified in at least two respects. The existence of gaps between the receptors must be accepted, and the arrangement of these elements must be modified from the evidence of microphotographs, although these may be misleading, because the network may be distorted by preparation and sectioning. Thus it might be deduced that the elements are approximately arranged, not in straight lines, but in curved lines, whose directions vary continuously as the retina is traversed. Further, since the geometrical arrangement of the receptors is not quite regular, it would be necessary to follow Parsons' theory of induction. Langlands has applied the photoelectrical theory to the retina; the light, falling on the photochemical liquid between the cones, causes energy to flow out, in the form of an emission of electrons from the region of incidence, to stimulate the neighboring cones. The perceptual pattern is derived from the distribution of the flow of energy in the afferent neurons. In the case of resolving power for two points the two energy distributions are intermingled: in vernier resolving power they are almost completely separated: in binocular resolving power the initial separation is complete. The instantaneous binocular acuity is based on the differentiation between the two energy distributions and the two resulting patterns. For illuminations of a duration shorter than the time in which the eyes can be set in motion, the binocular perception of difference of depth is based on a "momentary" cortical change which arises from the fact that the instantaneous uniocular patterns are different. This cortical change probably produces discharges through the upper cortical synapses, just as the intensity stimulus may produce discharges in the synapses at lower levels. When the eyes commence to move, this single cortical change may pass into a series of cortical changes with a series of corresponding synaptic discharges so that integration of depth perception can take place. *George H. Stine.*

De Oculis. By Benevenutus Grassus of Jerusalem. Translated from the Latin by Casey A. Wood. Cloth, duodecimo, 124 pages, 5 illustrations. Price $5.00. Stanford University Press, 1929.

This book was probably written in, or before, the twelfth century, and was first printed in Ferrara in 1474. About forty variants of the text are known to exist, twenty-two in manuscript and eighteen different printed editions. This translation was made from the first or Ferrara edition, and by comparison with other texts. It gives to English reading ophthalmologists an opportunity to learn something of the ancient history of the art they practice.

The translator's preface occupies twenty-two pages, and, in calling attention to the history and characteristics of this book, furnishes an interesting and informing introduction to medical history in general. This was "for over five hundred years the most popular ophthalmic manual of the Middle Ages". The absence of illuminated initials for the chapters "indicates that this first edition was intended to be a low-priced work, such as would meet a popular demand"; and "not to attract the attention of a few rich collectors".

Only four copies of this edition have been found in the libraries of Europe; but Dr. Wood found three copies in American libraries; one in the United States Army medical library, one in the library of the College of Physicians of

Philadelphia, and one in the Pierpont Morgan library in New York. It is pointed out that copies are so rare, probably, because they were used as a manual of practice and worn out. The one in New York was purchased in Manchester, England, and contains the autograph of "Jos. Jordan, F.R.C.S."

A rival for the honor of being the first printed book on ophthalmology is "Liber de oculo morali" by Johannes de Peckham. Dr. Wood points out that this was not a "serious or original contribution to the practice of medieval ophthalmology". Peckham was a versatile writer who belonged to the Franciscan order and became Archbishop of Canterbury. His book contains "a series of priestly homilies and quotations from the Fathers, in which a rather good description of the visual apparatus together with its diseases and their treatment, serves as a peg on which to hang saintly saws and religious dogmas". It seems to have been printed two years after the Ferrara edition of De Oculis.

Benevenutus Grassus speaks of himself as "of Jerusalem", describes his Jerusalem collyrium, his powder, and his Jerusalem electuary; and probably he was a Hebrew. It is not known where he was born, or where he wrote his book, or even the language in which it was first written. Most of the known manuscripts of it, as well as the printed editions, are in Latin. But the oldest known copy in manuscript is in Provençal. The author studied medicine at Salerno in Sicily, practiced in several cities of Italy and of the Near East, and in his later years lived and taught in Montpellier, France. He was not sparing of self-praise, and he frequently refers to his "cura gloriosa".

The first disease he deals with is cataract, to which nine sections are devoted. The twentieth century reader will see that for a thousand years at least cataract has been thought of as a cause of blindness and as the occasion for an operation. Grassus recognized four forms of cataract that were curable (by couching), and three that were incurable. The curable forms are cases of true cataract which we might recognize as still encountered. The "incurable cataracts" include "gutta serena" (blindness with clear pupil and nystagmus), the greenish pupil of glaucoma, and the widely dilated pupil of blindness from cerebral lesions.

The diseases of the conjunctiva and the inflammations of the eyeball, or ophthalmias, are hopelessly interwoven with the ancient conceptions of humoral pathology; and are befogged by lack of exact clinical observation. But it is interesting to learn how the author understood the relation of the tears to the lacrimal puncta. The elaborate directions for preparation and use of collyria, plasters and so on, some of which included fifteen or twenty ingredients, of supposed therapeutic virtue, emphasize the difference between ancient and modern ophthalmology. From this point of view it is a book worthy of study and thought on the part of any ophthalmologist. The work of the translator and annotator, as well as that of the publisher, leaves nothing to be desired. The illustrations are reproductions of pages from old printed and manuscript copies of this book. The last dozen pages give bibliographic information that will be valued in libraries. American ophthalmologists are to be congratulated on the production by one of their colleagues of a work of high historic value. *Edward Jackson.*

Section on Ophthalmology, American Medical Association, Transactions of the 1929 meeting, at Portland, Oregon. Cloth. 287 pages, illustrated. Chicago, American Medical Association, 1929.

This account of the section transactions comes out four months after the meeting, an early date for the proceedings of such a gathering; and shows the smooth, efficient working of the machinery of the American Medical Association, both physical and intellectual. As usual this volume contains all the

papers presented at the meeting, although the Journal, which has the first right of publication, had only used eight out of the seventeen presented. They were all printed in the presessional volume sent out to the members of the section, and some others may yet appear in the journals.

But to have them in this neat, compact volume, with the discussions they elicited, arranged and indexed in most convenient form for reference, is certainly worth the small charge made for it. They will be wanted in all medical reference libraries; and some of the early volumes of the series are already unobtainable. This volume contains two reports of committees, not to be found anywhere else; namely, the committee on optics and visual physiology, and the committee on trachoma among the Indians.

The report on the National Museum of Ophthalmic Pathology, by Major G. R. Callender, although brief is interesting. In the laboratory of the Army Medical Museum there have now been assembled 977 specimens. Of 629 the diagnoses have been furnished to the donors. The work done in this service is a very valuable contribution to American ophthalmology; and the doctor who sends in a specimen and in a few weeks receives a report on it with typical slides from it, is being richly rewarded for his contribution to the collection and to medical knowledge. A larger proportion of those who have to remove eyes should be giving and receiving the benefit of the service.

The presentation of seventeen papers gave opportunity for forty-five members to speak in discussions; and these remarks add much to the value of this volume. The report of the Knapp Testimonial Fund shows a list of 322 contributors thereto; these are permanent and active members of the section. The list of members who within five years have attended its meetings is omitted.

Edward Jackson.

CORRESPONDENCE

Cautery for retinal detachment: a note from Gonin.

To the editor:

One of my patients has just returned from Lausanne, Switzerland, where he was operated upon by Professor J. Gonin, who did his thermocauterization upon a detached retina.

Dr. Gonin had seen something of your editorial on this subject and wishes to advise you of one or two points which he stresses. He sent a letter to me and enclosed a statement which you will find herewith, requesting me to forward it to you.

I understand that it is important to use a Paquelin cautery with specially small tip: an electrocautery point is not suitable.

I may say to you that my patient had lost one eye from detachment six years ago. The retina began to separate in his other eye last June, and by the time he reached Dr. Gonin the first of October it was pretty well off with vision of hand movements only. The slit in the retina was in the superior temporal quadrant, well forward. Only one application of the cautery was necessary.

There has been a decided improvement. Although there was a slight hemorrhage into the vitreous and the latter is hazy, there is a much better color to the retina, the blood vessels are straighter, and it appears that there has been a bridging across the tear.

The patient's vision is now counting fingers at four feet, and better in some parts of field, which is remarkably full. We hope for further improvement but of course none can tell. *H. S. Miles.*

Bridgeport, Connecticut.

Professor Gonin's note is as follows:

"The reason why the treatment of so-called simple detachment of the retina is generally regarded as nearly hopeless may be largely explained by an insufficient knowledge of the fact that this accident is caused by a rent or tear of the retina, through which the liquid

of the vitreous passes into the interretinal or retroretinal space. Most practitioners pay little attention to these holes in the retina, while others (e.g. W. Lister) admit that they are frequently to be found but believe that they make treatment practically valueless and therefore contraindicate any operation. Both views are equally wrong; the latter opinion, particularly, causing many curable cases to be neglected. It is just the discovery of the tear in the retina which affords the possibility of a complete cure, because the hole may then be closed by means of thermopuncture through the sclerotic. An operation of this kind being much more practicable and successful in recent cases than in older ones, it ought not to be delayed by attempts at other forms of treatment which are generally useless."

OBITUARIES

Harold Gifford

Dr. James M. Patton writes:

Dr. Harold Gifford of Omaha died suddenly at his home on the morning of November 28, 1929, from an acute heart attack. He was born in Milwaukee, Wisconsin, October 18, 1858. He took the degree of B.Sc. from Cornell University in 1879 and his medical degree from the University of Michigan in 1882. He remained at the latter institution as assistant in pathology for a year, and then, having become interested in ophthalmology, went abroad for further study.

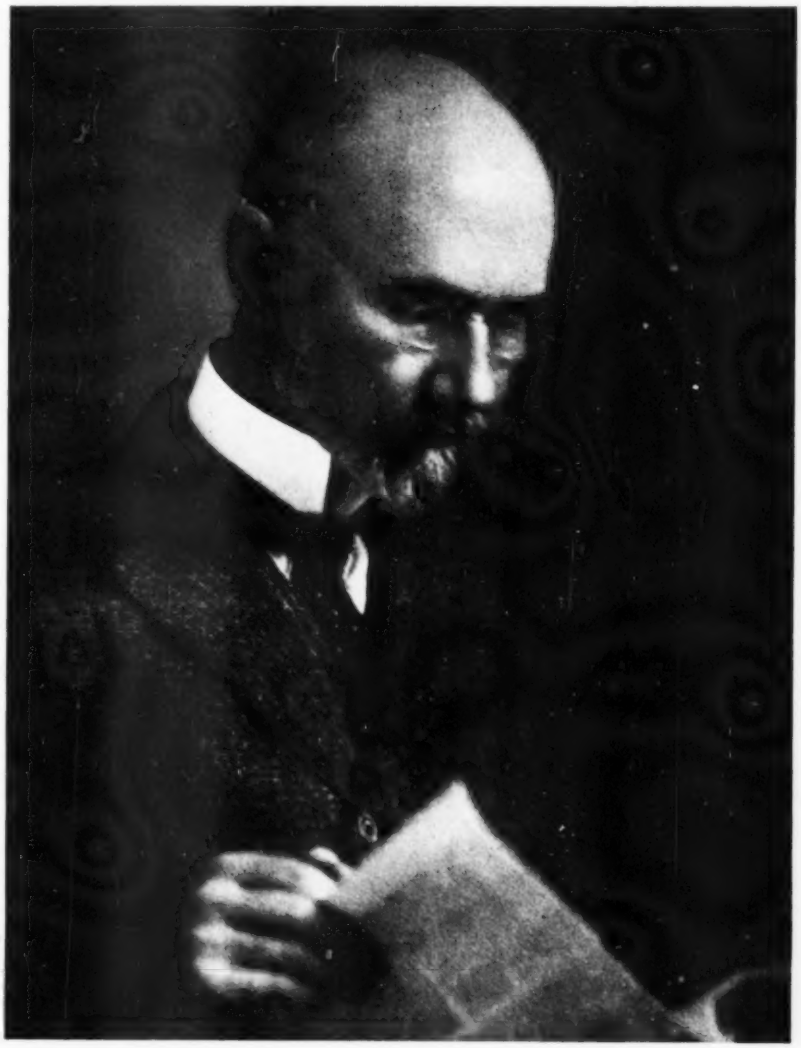
In the laboratories of the universities of Erlangen, Heidelberg and Zurich he conducted some of the earliest experimental work on bacteriology of the eye, and on that disease which has ever since been such a puzzle to ophthalmologists —sympathetic ophthalmia. He was appointed first assistant to Horner, then professor at Zurich, and one of the foremost clinical ophthalmologists of Europe. Returning to America, first in the New York Eye and Ear Infirmary, and later locating in Omaha in 1886, he put his training in scientific principles, which was unusual for that time, to good use in continued laboratory research and in the application of his findings to the problems of a busy practice, in which he was actively engaged until the time of his death.

In pure laboratory research, his early work on the experimental production of sympathetic ophthalmia, with his demonstration of the fact that organisms may travel from the inoculated eye along the lymph paths into the orbit, and thence to the nerve and the suprachoroidal spaces of the second eye, and his work on the drainage of the anterior chamber, will be remembered. In bacteriology his contributions have perhaps been most important. He was the first to describe the fact that the normal conjunctival sac contains numbers of organisms, some of which may become pathogenic when they are carried into the eye by trauma or operations. In 1896 he gave the first description in English of the acute conjunctivitis caused by pneumococcus, and first demonstrated that this organism was the cause, at least in the middle west, of this disease, by inoculations of secretion containing the organism on his own conjunctiva and that of an assistant, with production of the typical disease. Two years later he published the first description in English of the Morax-Axenfeld bacillus as a cause of chronic conjunctivitis and of corneal ulcer. In 1910 he was the first writer in English to describe involvement of the eyelids by the sporothrix, a member of the lower fungi which causes sporotrichosis, and the first in any language to describe a peculiar form of involvement of the ocular conjunctiva with this organism.

As a clinical observer, his name is attached to two eye symptoms which are of value in the diagnosis of exophthalmic goiter, and which he first described in 1906. In 1898 he reported the first American case of Parinaud's conjunctivitis, a rare condition which had previously been described by only a few observers in France and Austria. He was one of the earliest reporters of the juvenile form of family amaurotic idiocy, and his name has sometimes been associated with this disease.

In therapeutics, probably his most important contribution was the use of large doses of sodium salicylate in sympathetic ophthalmia, which has become the classical treatment of this disease in most countries.

eration for ptosis. The procedure of destroying the lacrimal sac with trichloracetic acid as a substitute for the troublesome excision of the sac in dacryocystitis, which has found wide acceptance, was original with him. He



Harold Gifford, 1858-1929

In ophthalmic surgery he made many important practical modifications of operations described by others, notably in the correction of ectropion by the use of Thiersch grafts, in the correction of cicatricial entropion by the use of mucous membrane from the lip, and in the method of carrying out the Machek op-

devised a form of trachoma forceps for expression of the folds, which presents decided practical advantages over previous instruments, and his brain-knife for exploring the brain for brain abscesses, though less known, is a valuable instrument.

His writings have appeared chiefly

in the form of articles for the various ophthalmological journals in the United States, England, and Germany. His most extensive works are complete reviews of the subjects of sympathetic ophthalmia, in the American Encyclopedia of Ophthalmology, and of congenital paresis of the abducens, published in part in the American Journal of Ophthalmology. He was one of the editors of the Ophthalmic Record from 1897 to 1918 and upon its fusion with other journals into the American Journal of Ophthalmology he became a collaborator in the latter journal.

As an educator, he was one of the founders of the Omaha Medical College, and he served that institution as professor of ophthalmology and otology, and for a time as dean of the faculty. He was one of those most interested in the absorption of that school in 1903 into the Nebraska University college of medicine, and he headed the department of ophthalmology and otology in that college when the fusion was effected, and until his appointment as emeritus professor in 1924.

His purely scientific work was limited in later years by the requirements of a large practice. Into the care of his patients he put, not only exceptional knowledge, clinical judgment, and operative skill, but also an intense personal interest. He never allowed personal inconvenience to interfere with anything which might add to a patient's chances. It was not unusual for him personally to see and treat a case of serpent ulcer three times a day. To those of us who worked with him, one of his most remarkable gifts was the ability to see at once if any case was not responding to treatment, when a different procedure would be commenced at once. His knowledge of ophthalmic literature was great, and he continued to read all the important journals of ophthalmology of the world until his death.

Besides his professional work, he found time for a surprising variety of other interests. An early interest in botany and zoology led him to travel extensively and to read all the books about travel and the flora and fauna of strange lands which he could obtain. It was also responsible for his active interest in preserving the natural life and beauty of the woods along the Missouri river. Politically he was a socialist, and he devoted much time to advocating various movements to bring about liberal reforms.

In recognition of his scientific and clinical work, he was granted the honorary degree of M.A. by the University of Michigan and of LL.D. by the University of Nebraska, and was chosen as chairman of the section on ophthalmology of the American Medical Association for its meeting in Denver in 1898.

The passing of Dr. Gifford will be mourned not only by his colleagues and associates, but also by the many to whom as a great physician he was able to bring comfort and hope.

Jacob Gray Dorsey

Dr. W. G. Gillett writes:

Dr. Jacob Gray Dorsey, who died November 15, 1929, aged sixty-nine years,

Jacob Gray Dorsey, 1860-1929

graduated from the College of Physicians and Surgeons, Keokuk, Iowa, in 1883. He spent the following ten years in the practice of general medicine in the territory surrounding Braymer, Missouri. He went to Wichita, Kansas, in 1893 to practice eye, ear, nose, and throat, but for the last twenty years his work was limited to ophthalmology.

Beside general medical organizations, he was a member of the American Acad-

emy of Ophthalmology and Otolaryngology and of the American College of Surgeons. His pleasing personality and friendly handclasp will be greatly missed at the meetings of these organizations, where he was almost a constant attendant. Dr. Dorsey was one of the best known and best loved ophthalmologists in the middle west. He was an untiring worker, a never failing supporter of the young physician, and a friend to all.

David De Beck

Dr. David De Beck of Seattle died November 18, 1929, aged seventy-four years. Dr. De Beck was born in Covington, Kentucky, graduated in science at the University of Cincinnati and at the Medical College of Ohio, studied ophthalmology two or three years in Europe, and then served as instructor in ophthalmology and later as professor of ophthalmology in the Cincinnati College of Medicine and Surgery. He removed to Seattle in 1902. He was a member of the American Ophthalmological Society, of the Deutsche Ophthalmologische Gesellschaft, and of the Société Française d'Ophtalmologie. In 1900 he was awarded the Alvarenga prize of the College of Physicians of Philadelphia. He was author of several monographs on ophthalmology.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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5. CONJUNCTIVA

Caramazza, F. and Silvagni, M. **Trachoma and nasal lesions.** Saggi di Oftalmologia, 1928, v. 4, p. 261.

Observations were carried out in fifty-five trachoma cases. Biopsy of conjunctival and nasal tissue was carried out in each of thirty-one cases; in twenty-one of these, sections of nasal mucosa were taken from the inferior turbinate, and in the other ten from the middle turbinate. The trachoma existed in its various forms and stages of evolution from the florid simple and mixed to the degenerative and cicatricial. All the above cases showed corneal pannus, twelve bilaterally.

Rhinoscopic examination revealed intranasal changes in all but two of the entire series of fifty-five cases. The predominating condition in thirty-five cases was a chronic catarrhal rhinitis. Concomitant with this and present in the majority of the latter was hypertrophy of the turbinates. In no case was hypertrophy of the turbinates confined solely to the middle turbinates. Simple bilateral atrophic rhinitis was found in four cases, three of these being in old trachoma patients and one in an early case.

In only five cases out of thirteen in which the trachomatous process was severe on one side, was a correspondingly more intense nasal change present on the same side. Not one of the remaining cases showed a relatively greater nasal change on the side opposite the worse eye.

Microscopic studies were made to determine the existence of special histologic changes in the nasal mucosa; that is, to determine if these changes assumed particular characteristics constantly and if eventually they were analogous to the histopathologic changes in the conjunctival mucosa. Sections of mucosa included the membrane from the fornix and from the inferior or middle turbinate between the head and the body of the turbinate.

The conjunctival sections all showed characteristic trachoma histopathology. Metaplasia of the superficial strata and cellular calcification existed in the upper layers. The stroma showed lymphocytic infiltration and a varying distribution of plasma cells.

The most frequent changes in the nasal mucosa were desquamation and metaplasia of the epithelium in stratified formation. In several cases calcification of cells was observed. As in the conjunctiva, the nasal stroma was infiltrated with lymphocytes and plasma cells, more abundantly in the superficial layers. No lymph follicles, however, were discoverable in the nasal mucous membrane. There was no perivascular cellular infiltration.

The regularity with which these lesions were found in the nasal mucosa of trachomatous patients, although present in other nasal affections, is considered by the authors to indicate a specific trachomatous reaction in these cases.

F. M. Crage.

Delanoé, E. **Unilateral trachoma of particularly serious character. Treatment with chaulmoogra oil and intravenous injections of novarsenobenzol.** Revue Internat. du Trachôme. 1929, v. 6, Jan., p. 1.

Delanoé reports a case of severe trachoma that remained strictly unilateral throughout its course (eight months). The participation of the palpebral portion of the lacrimal gland in the acute stage of trachoma is of especial interest in that it has not been reported heretofore. Rapid subsidence of the symptoms followed the use of chaulmoogra oil, both by vigorous massage of the conjunctiva and by instillation, and three intravenous injections of neoarsphenamin, as adjuncts to the principal treatment. The author feels that the effect of neoarsphenamin may be specific or similar to that of protein therapy. She recommends chaulmoogra oil as one of the most effective and least painful agents in the treatment of trachoma.

George H. Stine.

Eleonskaia, V. **Further investigations on inflammatory new growths and amyloid degeneration of the conjunctiva.** Russkii Opht. Jour., 1929, Aug., pp. 145-164.

The tumor-like granulations which appear sometimes in the conjunctiva in the course of a chronic inflammatory process—mostly trachoma—are characterized histologically by a marked polymorphism of their cellular elements. The predominance of lymphocytes or plasma cells makes them resemble lymphatic or plasmatic tumors. The usual outcome of these tumor-like formations is amyloid degeneration. In some of these cases a malignant metamorphosis has been observed.

M. N. Beigelman.

Fehmy, N., and Choukri, A. **The Wassermann and Meinicke reactions in trachoma.** Revue Internat. du Trachôme, 1929, v. 6, Jan., p. 36.

The authors made these tests in 200 trachomatous school children, ten to eighteen years of age. Of these, thirty were in the florid stage, and 170 were in the stage of cicatrization. The Wassermann was positive in two per cent (three boys and one girl), and the same results were obtained by the Meinicke test. It is concluded that the incidence of syphilis is not increased in trachoma, the claims of certain authors to the contrary notwithstanding.

George H. Stine.

Lindner, K. **Is the bacterium granulosis of Noguchi the cause of trachoma?** Graefe's Arch., 1929, v. 122, p. 391.

At the invitation of Dr. Proctor, the author came to America in the summer of 1928 to observe the condition of the eyelids of the monkeys infected by Noguchi with bacterium granulosis and to determine whether the trachoma of the American Indians was an essentially different type from the European.

The author reported the macacus rhesus monkeys and the one chimpanzee as showing clinically the typical picture of conjunctival folliculosis. At the summer school for Indians in Albuquerque, New Mexico, the eyes of ten girls and eight boys were examined clinically and microscopically for trachoma. Definitely trachomatous were eight of the girls and seven of the boys, although in four of the girls the trachoma had practically healed. In three of the four girls and in all seven of the boys with active trachoma the author found inclusion bodies.

Three cases used by Noguchi as the source of bacterium granulosis were investigated. Two showed active and one doubtful trachoma: inclusion bodies were found in the two active cases. Trachoma among the American Indians does not therefore differ either clinically or microscopically from that of Europe, Russia, India, and Egypt.

The author states that it is unfair to expect the American ophthalmolo-

gists to diagnose trachoma from a knowledge based on experience, since they see so little trachoma. In any event, he adds, those among them who give to folliculosis no position distinct from trachoma can appeal to Elschnig.

There is no doubt in the author's mind that the results of the inoculations of monkeys performed by Noguchi had nothing to do with trachoma. Noguchi cultivated bacterium granulosis partly from cases of folliculosis and partly from mixed cases of trachoma associated with folliculosis. Lindner has seen such mixed cases. It can hardly be doubted that in his bacterium granulosis Noguchi discovered not the cause of trachoma but the cause or one of the causes of conjunctival folliculosis. *H. B. Lamb.*

Morax, V. **Has trachoma increased in Paris since the war?** Revue Internat. du Trachôme, 1929, v. 6, Jan., p. 22.

Morax concludes that, if trachoma has increased somewhat in Paris since the war, this is due solely to the increase in immigration. Industry has brought in many foreign and colonial workers who have trachoma.

George H. Stine.

Nida, M. **Statistical note on trachoma in the clinic at Quinzevingts from 1914 to 1928.** Revue Internat. du Trachôme, 1929, v. 6, Jan., p. 25.

Although these statistics are not complete, it was found that trachoma did not exceed one per cent of the external ocular diseases seen in the clinic, or about one-third of one per cent of all patients examined. Of one hundred cases of trachoma, fifty at least were Algerians or persons who had contracted the disease in Algeria.

George H. Stine.

Sharova, K. F. **The treatment of trachoma by intravenous injections of ammoniated copper sulphate.** Russkii Opht. Jour., 1929, Sept., pp. 291-296.

In 1926 Meyerhoff introduced for the treatment of trachoma, intravenous injections of a four per cent solution of ammoniated copper sulphate, one to five cubic centimeters a day Sharova observed, following these injections, a marked general reaction: headaches, nausea and fever. Experiments on dogs revealed a definite toxic effect of ammoniated copper sulphate upon the red blood corpuscles. The author therefore advises caution in the therapeutic use of Meyerhoff's preparation.

M. N. Beigelman.

Vail, D. T., Jr. **Oculoglandular form of tularemia.** Arch. of Ophth., 1929, v. 2, Oct., pp. 416-428.

After a rather careful history of tularemia, calling attention to its association with Cincinnati ophthalmologists and pathologists, the author makes a summary of the ophthalmic cases of tularemia conjunctivitis so far reported. They are thirty-five in all. Twenty-three cases resulted from handling or skinning rabbits, eight from crushing a tick, one from a fly, and one from the bile of an infected woodchuck.

In a typical attack, the eyes begin to swell and itch after infection from twenty-four hours to ten days previously. Severe headache, chills and fever, and vomiting also occur. The glands of the head and neck begin to swell at the same time. The conjunctiva of the lids is a vivid scarlet, and shows numerous small, yellow, discrete ulcers. The cornea and bulbar conjunctiva are not, as a rule, involved. The discharge is straw-colored and mucoid. Gradually the ulcers become nodular and covered with a thin membrane. The active conjunctivitis subsides in about five weeks, the nodules disappearing without leaving a scar. Thickening, however, continues for several months. The glandular condition also continues for months and may result in suppuration.

Bacterium tularense is a small, pleomorphic organism, gram-negative, nonmotile, and nonspore-bearing. It is aerobic and grows best at 37 degrees C. It ferments dextrose, levulose, mannose, and glycerine, forming acid but not gas. It grows in coagulated egg yolk and blood-dextrose-cystine-agar.

It stains best with Giemsa solution. Agglutination is absent in the first week, increasing in the second, high in the third week and beginning to fall in the eighth week. Specific agglutinins, however, remain in the blood for years.

Microscopic studies have not been made. It must be distinguished from "Parinaud's conjunctivitis", the causative agent for which has been established as leptothrix and can be isolated in great numbers from greyish, focal areas of the conjunctiva. Tuberculosis and syphilis of the conjunctiva are also somewhat similar in appearance. Necrotic infectious conjunctivitis and pseudotuberculous conjunctivitis of rodents are two other conditions somewhat similar. Sporotrichosis, agricultural conjunctivitis, streptothrix, and acute trachoma are also to be taken into account. There is no specific treatment. Continuous hot applications of magnesium sulphate, physiologic sodium chloride, boric acid, or sodium biborate are best. The general treatment should be supportive, and if suppuration of the glands takes place they should be incised. *M. H. Post.*

Zachert. **Statistics of trachoma in Poland.** Revue Internat. du Trachôme, 1929, v. 6, p. 13.

Zachert has made an exhaustive analysis of all available data on trachoma in Poland. He finds that 1.63 per cent of school children (7 to 18 years of age) have trachoma. The index of trachoma in candidates for military service (20 to 25 years of age) is 114 per 10,000. The index of trachoma for the entire population is thus evaluated as fourteen per thousand. Analysis of the incidence by years shows an increase in trachoma, but the author believes this to be due to better regulation, more careful examination, and closer adherence to the law which makes the reporting of trachoma compulsory. The statistics also indicate that trachoma is much more prevalent in the departments of the northeast, but this is probably due to stricter examination in these departments.

George H. Stine.

6. CORNEA AND SCLERA

Cange, A. **The white granules of leprous iritis and keratitis.** Arch. d'Opht., 1929, v. 46, July, p. 385. (See Section 7, Uveal tract, sympathetic disease, and aqueous humor.)

Dami, D. **Sanguineous infiltration of the cornea, or keratohema.** Rev. Gén. d'Opht., 1929, v. 43, Jan., p. 5.

Two cases of this rare condition were studied at the ophthalmic clinic of the University of Geneva. The bibliography includes twenty-nine references. The author concludes:

1. Sanguineous infiltration of the cornea, falsely called corneal hemorrhage, is a rare ocular affection of which the symptomatology is simple and the diagnosis relatively easy.
2. It is of traumatic origin but perhaps influenced by fixed and preexisting factors.
3. The staining of the cornea is due to a deposit of blood pigment under the double form of hemosiderin and hematoidin.
4. The pathogenesis is mechanical. It originates from venous stasis in Schlemm's canal and in the anterior ciliary vessels, and is perhaps favored by a trophic affection of the cornea.
5. Recovery, which may be incomplete, is spontaneous. Treatment is useless. *J. B. Thomas.*

Dollfus, M. A. **Tattooing of cornea with gold chloride.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 722-725

The method of Knapp has been used by the author for the past three years with gratifying results.

Lawrence Post.

Koby, F. E. **Changes in the thickness of the cornea, viewed with the slit-lamp.** Rev. Gén. d'Opht., 1929, v. 43, Feb., p. 57.

The slit-lamp is the only instrument which permits one to judge the approximate thickness of the cornea even at first glance. Furthermore, the use of the micrometer makes possible a true biomicrometry. The center of the cornea is thinner than is generally stated, having an average of 0.55 to 0.60 mm.

It increases in thickness from center to periphery. In case of change of thickness of the central or paracentral areas of the cornea, visual acuity is more or less lowered. This latter may be due theoretically to three factors, acting singly or combined: (1) lessened transparency of the cornea; (2) deformation of the anterior or posterior surface; (3) alteration of a surface of discontinuity in the interior of the cornea.

The author describes and illustrates numerous conditions which cause a thinning of the cornea, which he believes to be due always to loss of substance of the anterior surface. Among these are keratoconus, traumatic ulcers, contusion, marginal ectatic degeneration, and hydrophthalmos.

Thickening of the cornea is usually the product of infiltrates of a temporary nature, such as exist in keratitis of syphilitic, tuberculous, or traumatic origin. Imbibition of aqueous humor by the cornea may cause localized thickening. Keratitis disciformis causes a striking thickening of the cornea extending backward and causing a circular reflex which Vogt has studied. In the superficial reticular keratitis of Haab the slightly raised epithelium follows a more or less horizontal line across the interpalpebral space, and on focal illumination may appear as a bright band across the cornea.

J. B. Thomas.

Pillat, Arnold. **Does keratomalacia exist in adults?** Arch. of Ophth., 1929, v. 2, Sept., pp. 256-287, and Oct., pp. 399-415.

The author reviews the cases reported in the literature, especially those pertaining to adults, first from European clinics and afterwards from Eastern clinics. He points out that study of this disease is facilitated in adults, as progress is less rapid. Keratomalacia in adults follows the condition more frequently met with in children, beginning with simple xerosis of the epithelium, that is, Bitot's spots, hemeralopia, xerosis cornea without ulceration and later with ulceration and necrosis of the cornea, that is, keratomalacia proper. Six cases are reported in detail, varying from the mildest forms to the most severe. Each case is commented upon individually. The second half of the paper is taken up with a general commentary on the various aspects of the disease.

The six cases illustrate the tendency of xerosis of the conjunctiva in many instances to skip the limbus of the cornea and attack the center in more or less sphere-shaped plaques. As a general rule, however, the xerosis of the conjunctiva and cornea is continuous. In several cases the xerotic process was confined to the conjunctiva under the upper lid. It shows a predilection for old corneal scars, where exfoliation of the epithelium follows, resulting in a secondary infection and keratomalacia. The disease is essentially noninflammatory. Staphylococci, xerosis bacilli, the diplobacillus of Morax-Axenfeld, pneumococci and streptococci are frequently present in the conjunctival sac. The bulbar conjunctiva is more involved than the palpebral. When the palpebral conjunctiva is involved, the appearance may be similar to that of trachoma. Its yellowish red color and dry state, however, should insure a correct diagnosis. In the lower fornix there are humps and folds like cloudy fused follicles.

The color in the later stages may be brownish gray, simulating argyrosis. The conjunctiva of the eyeball shows Bitot's spots in the palpebral fissure, or extensive islands of xerosis. Occasionally, however, with marked corneal involvement, there is little conjunctival change. The folds of conjunctiva run either parallel or concentric toward the limbus, occasionally covering it to some extent. They are dull red in color. The xerosis disappears by breaking up of the islands, the parts becoming gradually smaller and smaller. Ulcers of the cornea probably originate (1) from secondary invasion of the pathogenic bacteria, (2) as a result of nutritive disturbance, due to damage to the trigeminus, and (3) as disease of the parenchyma associated with that of the epithelium. The lens suffers a decrease

in luster of the anterior and, probably, of the posterior capsule. The shagreen oscillates in browns and grays. Anesthesia of the cornea may be partial or complete. Hemeralopia is generally present. As to the condition of the eye ground, the corneal condition makes a determination very difficult. The disease occurs probably at all ages. Diet is the deciding factor. Meat and green vegetables were absent, or nearly so, from the diet of all patients seen, butter almost unknown, and fresh fruit was not obtainable in the spring. Insufficiency of fat soluble vitamin A appears to be the most potent factor. All cases were accompanied by intestinal disturbances, either diarrhea or constipation, probably the result of changes in the mucous membranes of the intestines. The mucous membrane of the mouth and larynx undergoes changes causing hoarseness, nasal catarrh and bronchitis. Epithelial cells are present in the urine, the hemoglobin of the blood is decreased. The skin is dry, of an earthy consistency, and much exfoliation of the superficial epithelium occurs. Cracks may appear in the skin, which later become infected, causing deeply pitted ulcers. Comedones are frequent, due to inactivity of the sebaceous and sweat glands. A varying rise of temperature up to 100.2° appears to be characteristic. The hair is extremely dry, the nails become chalky. The extent to which the glands of external secretion are involved remains to be answered by further investigation.

M. H. Post.

Pillat, A., and King, G. **An inquiry into the origin of the abnormal pigmentation of the skin and conjunctiva in cases of keratomalacia in adults.** Brit. Jour. Ophth., 1929, v. 13, Oct., p. 506.

The literature pertaining to this type of pigmentation is obtainable only in China, India, and Japan. Kirkpatrick refers to the pigmentation as an icteric tinge. Wright suggests that the liver plays an important part in keratomalacia. Mori states that the pigment is melanin. The pigmentation is of a peculiar dark brown color similar to "argyrosis" or to that found in Addison's disease. In order to determine what rôle the liver played in the production of this conjunctival pigmentation these investigators undertook special liver function tests in a series of twelve cases of keratomalacia. The tests used were the levulose tolerance test and the quantitative determination of the bilirubin in the blood serum. The result of these experiments is discussed and set forth in a table. The investigation seems to show that it is improbable that any marked degree of impairment of liver function is present in cases of keratomalacia and that the pigmentation found in such cases is probably not of biliary origin. *D. F. Harbridge.*

Tooker, Chas. **Allergic phenomena in tuberculous keratitis; report of two cases.** Arch. of Ophth., 1929, v. 2, Nov. pp. 540-544.

The term allergy was first introduced by Cooke to indicate a hypersensitiveness to proteins or other substances which are innocuous to normal people. Anaphylaxis, on the other hand, is a condition of sensitization produced by previous injections of a similar protein. The former has not been produced experimentally in animals and is comparatively mild, as in cases of drug idiosyncrasy. Luedde wrote in 1923 that tuberculin reactions regarded as specific might be allergic phenomena.

Tuberculous iritis is probably never primary, except as it may follow an injury where latent tuberculosis is present. The secondary type may be ulcerative or interstitial and frequently has its primary seat in the ciliary body, iris, or sclera, or enters from infections through the aqueous.

Both cases presented showed allergic reactions to a number of foods and also an atropin angioneurotic edema. This association appears significant to the author, who thinks the presence of the latter should suggest the possibility of the former, and feels that such allergy should be investigated for its possible bearing on the keratitis present.

M. H. Post.

Towbim, B. G., and Prosorowski, B. M. **The pathogenesis of parenchymatous keratitis and its connection with the endocrine system.** Graefe's Arch., 1929, v. 122, p. 257.

Twenty cases of parenchymatous keratitis examined in the clinic at Woronesh showed changes in the vegetative-endocrine processes. These changes frequently consisted of an inhibition of growth or of the general development of the organism, or of an increased growth of the bones or an excessive deposit of fat, but vasomotor changes also were found, particularly a tendency to sweating, to cyanosis of the extremities, or to red dermographia; the latter was observed in many of the cases. In addition there was found in fifteen of the cases a diminution of hemoglobin as low as sixty per cent and in eleven a lymphocytosis of from thirty-one to thirty-nine per cent. Lastly changes of the vegetative nervous system consisting of an absolute or relative parasympathicotonia were seen.

The developmental changes were due to sclerosis with underdevelopment or degeneration of the endocrine glands, most frequently of the thyroid. These changes were observed more often and were more intense in congenital than in acquired lues.

The combination of lues with vegetative-endocrine disturbances, the immediate result of luetic degeneration, is apparently the direct cause of parenchymatous keratitis. *H. D. Lamb.*

7. UVEAL TRACT, SYMPATHETIC DISEASES, AND AQUEOUS HUMOR

Beeler, A. **The heterotypical conus.** Graefe's Arch., 1929, v. 122, p. 342.

There was found in sixty-two eyes belonging to thirty-five individuals a conus of heterotypical direction which in 69.5 per cent of the eyes was associated with an ectasia of the fundus visible with Gullstrand's binocular ophthalmoscope in the same direction as the conus. This ectasia is accompanied by a relative pigment deficiency of the affected part of the fundus. With the inferior conus, as with axis myopia, there can be present an atrophy of the choroid progressing with age and with the increase of refraction. Fundus ectasia below is in this sense comparable with the fundus ectasia of myopia. Conus below and in other heterotypical directions is as frequently inherited as hyperopia, myopia, and other refractive errors, and like these latter is a propagated anomaly of growth, belonging to an embryonic predisposition.

H. D. Lamb.

Brown, A. L., and Dummer, C. **The experimental production of iritis.** Arch. of Ophth., 1929, v. 2, Nov., pp. 573-577.

Iritis has been produced experimentally in several instances. The Lewis case is probably best known and typical. The bacillus of hemorrhagic streptococcus cultured from a tooth removed from a patient suffering with iritis produced iritis in a rabbit when injected intravenously.

In the author's experiments injections are made into the carotid of rabbits under surgical antisepsis. Iritis was produced in a rabbit twenty-four hours after injection of a hemolytic streptococcus recovered from the nasal secretion of a patient with severe iritis. Iritis could not be transferred to a second rabbit from the same organism recovered from the uveal tissue of the first animal, but when the animal died thirty days later the organism was found in the liver, spleen, heart, kidneys, and lungs. Three times the same results were obtained. Moreover, the original strain grown artificially produced very mild circumcorneal injection or none at all in five animals, but it was found in the various organs of two of these rabbits when they died some time later. Attempts to produce local sensitivity were without result, as were those to produce generalized sensitivity, though these results are open to question. *M. H. Post.*

Cange, A. **The white granules of leprous iritis and keratitis.** Arch. d'Opht., 1929, v. 46, July, p. 385.

Two patients afflicted with leprosy and ocular complications in the form of

iritis and keratitis were examined. By ordinary methods of examination no specific peculiarities were noted. With the slit-lamp and corneal microscope there were found in both cases small white wax-like nodules with the appearance of a grain of uncooked tapioca and about the size of a small pinhead, both in the cornea and scattered upon the anterior surface of the iris. An illustration of the iris condition accompanies the article. It is concluded that these granules are specifically diagnostic of leprosy. *M. F. Weymann.*

Car, A., and Ortynski, H. **Experimental findings on the action of extracts of glands of internal secretion upon the regeneration of the aqueous humor.** Graefe's Arch., 1929, v. 122, p. 240.

Experimental research with rabbits showed that a subconjunctival injection of five per cent cocaine and two per cent diocain produced no effect upon the regeneration of the aqueous humor. Subconjunctival injection of 0.2 c.c of glaucosan showed an amount of albumen at the second puncture less than in Wessely's experiment with adrenalin. This fact could be explained by the greater amount of adrenalin used in Wessely's experiment, and also perhaps by the less specialized action of the glaucosan. After subconjunctival injection of 0.2 c.c. of "glanduitrin" there was found in the aqueous humor at the second puncture an index of refraction of n=1.33716 and the albumen by Brandberg's method was 0.69 per cent. The action of "glanduitrin" was therefore much more intensive than that of glaucosan. Extract of the parathyroid gland showed a diminished content of albumen in the second aqueous humor. Insulin gave a result similar to that from the last used substance, although less pronounced. The normal and control findings varied between 2.5 and 3.2 per cent albumen. Similar results were obtained with extract of thyroid, thymus, testis, or ovary.

Since in the authors' cases there was no significant effect upon the bloodvessels, the small production of albumen must be related not only to the vasoconstrictor but perhaps also to the osmotic and the secretory components of the mechanism of albumen production.

H. D. Lamb.

Fuchs, Ernst. **The ciliary vessels.** Graefe's Arch., 1929, v. 122, p. 219.

The author reports his observations on the amount of sclerosis in the ciliary vessels as found in their course through the orbit and within the eyeball. Normally the ciliary arteries have a thicker wall than arteries in other parts of the body, with lumens of the same size. In the production of this thickening the media is not so much involved as is the adventitia. During the passage of the ciliary arteries through the sclera the adventitia diminishes in thickness, and it is entirely absent in the anterior half of the scleral thickness, to reappear again when the sclera has been passed.

Senile changes in the ciliary arteries consist of a thickening of the subendothelial layer, composed of fine bundles of fibrillar connective tissue arranged for the most part circularly. This subendothelial layer may become as thick as the media and adventitia combined. The lumen of the vessel is thus narrowed, although it is only exceptionally closed. With advancing age, also, the elastica interna is thickened, and newformed thin elastic lamellæ occur within the subendothelial layer.

Where the ciliary arteries with senile changes pass through the sclera, the thickening in the subendothelial layer diminishes or disappears, while the elastica interna becomes thicker than in the same vessels outside. In the choroid the ciliary arteries show little or no such changes. Sclerosis is shown by a thickening of the elastica interna and often also of the adventitia, which at times becomes hyalin. It is otherwise in cases of nephritis and syphilis, where pronounced sclerosis of the choroidal vessels is present while the ciliary arteries in the orbit are usually without change.

A detailed description of the normal orbital ciliary veins is appended.

H. D. Lamb.

Johnston, Kenneth B. **The ophthalmoscopic picture of nevus (melanoma) choroideæ.** Brit. Jour. Ophth., 1929, v. 13, Oct., p. 498.

The author reports three cases, seen clinically, from Professor Meller's clinic. He points out that the color of a true nevus is always a uniform slate grey. The outline varies from feathery to sharp, depending on the degree of involvement of the layers of the choroid and the amount of the pigment. The elevation is rarely sufficient to be measured clinically. The size and shape does not alter over long periods. The retinal pigment epithelium is not involved in the nevus. Since sarcoma of the choroid tends usually to grow inwards, we may expect to see some sign of pigmentary disturbance of the pigment epithelium over the nevus as a very early sign of a beginning malignancy from such a source.

Four photomicrographs, a table of nine cases, and ten references are presented.

D. F. Harbridge.

Woods, Allan C. **The relationship of the flavobacterium ophthalmiæ to periodic ophthalmia in horses.** Arch. of Ophth., 1929, v. 2, Oct., pp. 456-467.

In this paper the authors report a series of experiments made to determine whether they could confirm the results of Rosenow with regard to the causative relationship of flavobacterium ophthalmiæ to periodic ophthalmia in horses.

This bacillus was described by Rosenow as a yellow, pigment-producing, gram-negative, slender rod growing fairly well on ordinary media, liquefying gelatin, but not fermenting indol, and not digesting Loeffler's milk. Flavobacterium ophthalmiæ itself and its filtrate were both reported to be toxic. Pure cultures injected into the eyes of horses produced typical lesions. In one horse the uninjected eye became affected. The serum of affected horses had agglutinating power for the bacillus, and an immunity could be produced in rabbits. Rosenow concluded that the infection was hematogenous, that the portal of entry was the alimentary canal, and that the organism was harbored in various foods and water.

To the authors of this paper the description of the disease produced by the organism of Rosenow suggests a low-grade uveitis, such as that reported by Guillery following the intravenous injection of certain bacteria which produce pigment and ferment. The instance of the involvement of the uninoculated eye of one horse is, however, of especial interest. The organisms sent the authors by Rosenow were as described by him and were, an addition, proteolytic and non-acid forming. Those listed by the authors as positive showed like characteristics, but at times showed slight proteolytic activity and light acid production.

The authors' experiments lead them to conclude that they are unable to establish the relationship of flavobacterium ophthalmiæ to periodic ophthalmia in horses. They found it widely distributed, about equally on infected and noninfected farms. They found it constantly in the conjunctival sac of infected and noninfected horses. They were unable to recover the organism from the interior of the eye, whether involved or noninvolved, in any instance. Specific agglutinins could not be found in the blood serum of affected horses. Intravenous injection produced no ocular lesion in horses, and intraocular injection only a low grade secondary uveitis. They feel that this reaction was a product of protein degeneration similar to that produced by cultures and filtrates of prodigiosus and pyocyaneus.

M. H. Post.

8. GLAUCOMA AND OCULAR TENSION

Fortin, E. P. **The canal of Schlemm and the pectinate ligament.** Arch. de Oft. de Buenos Aires. 1929, v. 4, July, p. 454.

In this article, which is accompanied by four excellent illustrations, the author refers to a previous publication in which he discussed the rôle of the ciliary muscle in the causation of glaucoma.

In the normal eye, between the dorsum of the ciliary muscle and the sclera,

the line of union is freely movable. During contraction it slides forward upon the sclera, which relaxes the canal and allows aqueous to be evacuated.

As the anterior lens surface bulges sharply forward during accommodation, additional space must be provided in the incompressible aqueous. This occurs by the ready exit of aqueous through the canal, which is rendered more patulous during the process of accommodation.

Thus the action of the ciliary muscle upon aqueous may be compared to that of the heart muscle upon the blood stream, in that it is propelled by each contraction from the anterior chamber into the canal of Schlemm.

An attack of glaucoma can be produced either by an excess of fluid, or by flaccidity of the ciliary muscle as a result of which its expulsive action cannot be carried out. As the innervations of the sphincter pupillæ and ciliary muscles are derived from the same source, flaccidity of the ciliary fibers will be accompanied by weakness of the sphincter. Thus in frank glaucoma we see the dilated pupil, along with paralysis of the muscles of Brücke and Müller. When the latter is involved it allows the root of the iris to be approximated to the limbus, producing the characteristic shallow anterior chamber.

Glaucoma is more likely to occur in hyperopes on account of excessive action and resulting fatigue of the ciliary muscle.

By "ligament" is usually meant a solid collection of white fibers united in cord shape, and surrounded by an aponeurosis. As the iridocorneal angle is draped with a gauzy tissue, radiating in the form of a fan from the anterior border of Schlemm's canal to the base of the iris, this should hardly be classed as a "ligament".

During accommodation, the ciliary muscle closes toward the axis of the eye, not only relaxing Schlemm's canal and allowing it to open, but also the fan-like tissue spaces which allow the fluid to drain through. This same effect is produced by eserin, which explains its therapeutic efficiency. When the ciliary muscle is at rest, the canal is reduced to a slit, and over it the fibers of the pectinate tissue are folded to still further block entrance to the canal.

It is significant that before pigment particles can be made to escape readily from the anterior chamber through the pectinate "ligament", it is necessary to first place the eye under the effect of eserin. Otherwise the pectinate fibers filter them out. *A. G. Wilde.*

Gifford, S. R. **Some nonsurgical aids in the treatment of glaucoma.** Brit. Jour. Ophth., 1929, v. 13, Oct., p. 481.

The author confesses the belief that sooner or later nearly all cases of glaucoma will require surgical intervention. In this contribution he discusses his own experience and the views of other observers in the use of adrenalin, glaucosan and ergotamine. In a summary he states: (1) Adrenalin or glaukosan is of value especially in simple glaucoma, and by its means tension may be kept normal for considerable periods in certain cases. (2) Miotics should be used to prevent acute rise of tension when using adrenalin and to prolong its effect afterwards. (3) Amino-glaucosan presents the danger of increasing inflammation, and fails to reduce tension in many cases. (4) Hypertonic solutions can be depended upon to reduce tension before operation in acute glaucoma, and are without danger to the eye. (5) Ergotamine will reduce tension appreciably, it may be of much value in a small percentage of cases, and may be tried safely in any case. (6) All methods of treatment demand careful watch of the vision, fields and tension, so that progress of the disease may be noted early enough for effective surgical intervention. *D. F. Harbridge.*

Seregin, D. F., and Kapzikovskaia, R. S. **The significance of destruction of iris pigment in the etiology of glaucoma.** Russkii Opht. Jour., 1929, Aug., pp. 199-205.

Sixty-two normal eyes of various ages and ninety-three glaucomatous eyes were studied with the slitlamp with a view to establishing the signi-

ficance of pigment destruction in the pathogenesis of glaucoma. Destructive changes in the pigment epithelium of the iris were frequently found in senile eyes with normal intraocular pressure, while in glaucomatous eyes the amount of free pigment was in proportion to the degree and stage of hypertension. It is therefore the author's opinion that, contrary to Koeppe's theory, pigment destruction in glaucomatous eyes is one of the manifestations of impaired lymph circulation and nutrition and is rather a consequence than a cause of hypertension. *M. N. Beigelman.*

9. CRYSTALLINE LENS

Goulden, Charles. **Some unusual forms of acquired cataract.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, pp. 97-106.

The author describes the slit-lamp appearance of various forms of acquired cataract. All his cases occurred in patients of an age at which we do not expect to find senile changes in the lenses. The series included cases of myxedema, postoperative tetany, myotonia atrophica, mongolism, cretinism, and diabetes. In all the cases the diagnosis of the systematic disease present was definitely established and presented various symptom complexes, which are ascribed to disturbances in one or other of the ductless glands. Certain points of similarity were noted in all the cases mentioned, in that the opacities were almost entirely confined to the lens cortex, and were associated with iridescent opacities of crystalline appearance, and of a green, blue, or red color.

A. B. Bruner.

Hoorgina, E. **Biomicroscopic investigation of deposits on the anterior lens capsule.** Russkii Opht. Jour., 1929, Sept., pp. 274-290.

A slitlamp study of the anterior lens capsule in advanced age, in forty-eight of the one hundred cases examined, revealed changes identical with Vogt's "separation of the zonular lamella". These alterations are particularly frequent in glaucoma, senile cataract, and diabetes. In the author's opinion, they represent deposits precipitated from a chemically changed aqueous upon the lenticular surface.

M. N. Beigelman.

Karr, W. G., and Tassman, I. S. **Glutathione in the crystalline lens.** Arch. of Ophth., 1929, v. 1, Oct., pp. 431-436.

In 1893 Moerner demonstrated that the soluble portion of the lens protein, representing in greater part the sulphur content, was composed of two constituents. Sodium nitroprusside, with a drop of ammonia, will turn the normal lens a decided red. The cataractous lens will be unaffected in those parts which have become cataractous. This positive reaction was caused by the amino-acid cysteine. By oxidation, cysteine becomes cystine. Heffter demonstrated this process to be reversible, due to the labile hydrogen of the SH radical. In 1921, Hopkins discovered a dipeptid which he named glutathione and which was a combination of cysteine and glutamic acid. He showed that it also had the same reversible oxidation reduction property formerly attributed to cysteine and gave the same nitroprusside reaction. This paper shows the results of an attempt by the authors to determine the quantitative presence of glutathione in both the normal and cataractous lens. They found glutathione present in the normal lens of the pig, 0.296 per cent, and also an equilibrium ratio between cysteine and cystine of 0.296:0.704, equal to 0.420, while in cataractous lenses from a human being glutathione was found to be entirely absent. It is possible that various influences which disturb this reversible oxidation reduction process may produce formation of cataract. The authors found that increased temperature hastened oxidation. In acid media it was retarded; in alkaline it was hastened. Iron, copper, mercury, and arsenic also stimulated the process, while potassium cyanide, lead, nickel, cobalt, and cadmium retarded it. Thompson and Voegtlen found glutathione concerned in the chemical defense of the body against certain metallic poisons, whose toxic action they be-

lieved to be a disturbance of this oxidation reduction process; a suggestive finding in its possible relation to the development of cataract in the eye.

M. H. Post.

Manes, A. J. **Extraction in capsule.** Arch. de Oft. de Buenos Aires, 1929, v. 4, July, p. 426.

In this well illustrated article, extraction in capsule is favored on account of elimination of secondary cataract and postoperative glaucoma from retained particles, as well as iritis from absorption of lens substance.

Operations are done on the patient's own bed, which is equipped with wheels, and can be varied in shape as an operating table. A preliminary "proof bandage" is used to detect abnormal secretion. The general condition is carefully gone over, especially the teeth, tonsils, and toxemia. Hypertension can be temporarily corrected by the extraction of 300 c.c. of blood. When there is an eversion of the punctum it is sealed off with the galvanocautery, and remains closed three or four days. If there is a frank dacryocystitis or epiphora, a preliminary Toti operation is done.

Retrobulbar injections of adrenalin-novocain through the skin augment the dilatation. Injections of adrenalin at the limbus are not recommended. Akinesia is invariably used, with the same solution as for the retrobulbar injection. Absolute silence is enforced in the operating room.

A fixation suture is passed through the tendon of the superior rectus. A liberal conjunctival flap is made, and sutures of black silk are passed prior to the corneal section. After a peripheral iridectomy, Elschnig forceps are passed into the anterior chamber closed, and placed in contact with the inferior portion of the lens surface. Gentle traction is made from side to side for ten to fifteen seconds, and when the forceps are raised, the lens in its capsule follows. Final extraction is assisted by a strabismus hook or Daviel spoon, light pressure being made so as to bring the lens away entire. Gentleness and deliberation are essential.

After the lens is delivered, the knot in the conjunctival suture is tied. Usually the iris returns to its proper place spontaneously, or it can be assisted by external pressure. The edges of the corneal incision are touched with Pregl's solution, or dilute tincture of iodine.

The results have been very gratifying in the one hundred and fifty operations performed. There has been no detachment of the retina, but detachment of the choroid has been detected in twenty-three cases. *A. G. Wilde.*

Polak, B. L. **Remains of the tunica vasculosa lentis and their correlation with anterior capsular cataract.** Russkii Opht. Jour., 1929, Aug., pp. 165-178.

Five cases of combined anterior capsular cataract and persistent pupillary membrane are reported. The slitlamp findings and the various embryologic views are discussed in detail.

M. N. Beigelman.

Vassutinsky. **Extraction of cataract with suture.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 699-704.

The pupil is widely dilated with adrenalin 1 to 1000 injected subconjunctivally. A Graefe incision is made through the cornea, leaving an undermined flap of conjunctiva which is not cut through until a suture is passed through the flap under the knife from below upward. After cutting the flap and discission of the capsule and extraction of the lens, the conjunctival suture is tied. In twenty cases no prolapse of iris was noted.

Lawrence Post.

10. RETINA AND VITREOUS

Abraham, S. V. **Retinochoroiditis juxtapapillaris (Jensen).** Arch. of Ophth., 1929, v. 2, Oct., pp. 452-467.

This condition was first reported by Jensen in 1909. At first a whitish, slightly prominent, ovoid, infiltrated area extends from the border of the optic disc. The vessels in the immediate neighborhood are narrowed. The vit-

reous is hazy at the start, later clearing. It begins in young adults of either sex without evidence of syphilis, tuberculosis, or cardiovascular disease. Progression does take place, but very slowly. No histological examinataion has been made. It is a local inflammatory condition of a toxic or infectious nature, with involvement of the retinal blood vessels and of a small group of nerve fibers in the anterior part of the optic nerve sheath. *M. H. Post.*

Arnold, Max. **Further contribution to the knowledge of cystoid macular degeneration (honeycomb macula) with remarks on the technique of red-free light.** Graefe's Arch., 1929, v. 122, p. 299.

Further observations under Professor Vogt at the clinic in Zurich and Basel indicate that cystoid macular degeneration (honeycomb macula) is rather common and belongs in particular to the more frequent changes of chronic iridocyclitis. The clinical findings are given in eleven cases in which cystoid macular degeneration was associated with iridocyclitis. Only three patients were over thirty years old. An accurate diagnosis of the macular change is possible only with red-free light. Sufficient light to view the macula efficiently is impossible without an arc-light. Through the addition of a quicksilver regulator and a one-phase indirect current of 220 volts, variations in the intensity of the arc-light were prevented. *H. D. Lamb.*

Deutschmann, R. **Retinal tears, especially as to their significance in detachment of the retina.** Graefe's Arch., 1929, v. 122, p. 359.

Just as retinal tears may occur without causing retinal detachment, so there are detachments of the retina with no retinal perforations. For the production of a primary retinal detachment through a nonperforating injury considerable force is necessary when the eye is not predisposed to detachment. On the other hand, where the eye is predisposed an exceptionally slight force suffices. The predisposition is ordinarily present in myopic eyes. This predisposition in myopic eyes consists in fluidity of the vitreous, greater permeability of the choroidal vessels leading to transudates and hemorrhages, and a tendency of the retina to tear especially in the region of the ora serrata as the result of trauma. Among the author's many cases of retinal detachment, in only a small percentage was the ocular tension reduced. The author thinks it rarely occurs that the preretinal fluid gets under the torn retina and raises it from the choroid as Leber suggested. Statistics have shown that the percentage of retinal detachment is the same in all degrees of nearsightedness. In the author's opinion most retinal tears are not a primary condition but are secondary to detachment. Retinal perforations occur much more frequently above, tears below; the detachment begins commonly in the upper half of the eyeball. Perforations in the retina are more frequent than statistics indicate, due to the fact that they may heal spontaneously in the course of retinal detachment. Nevertheless the author is convinced that retinal tears or perforations are not always present in detachment of the retina. *H. D. Lamb.*

Gager, Leslie T. **Hypertensive retinal disease.** Arch. of Ophth., 1929, v. 2, Sept., pp. 307-314.

The retinal changes in the course of hypertension may be divided into two principal groups: (1) those which are due to vascular disturbance, and (2) those which have no inflammatory element. In the first group three stages may be distinguished: (1) that characterized by spasm of the arterioles, (2) by arteriosclerosis and (3) by hemorrhage. The second group shows neuroretinal edema and exudate, and finally both classes show degenerative and atrophic changes. Spasm of the arterioles is the first symptom noted. Following this and the resultant increased tension, structural changes occur in the intima and media which may be observed with the ophthalmoscope. Hemorrhage indicates a severe lesion. Exudation is frequent. If vascular

sclerosis is absent, a purely inflammatory condition, including nephritis, is probably present, but if renal arteriosclerosis is present it is probably not inflammatory, but rather, especially in association with hemorrhage and edema, indicative of malignant hypertension. Study of the retina gives early information with regard to this constitutional disturbance and makes possible earlier and vastly important treatment of the condition. *M. H. Post.*

Goldstein, I., and Wexler, D. **The ocular pathology of periarteritis nodosa.** Arch. of Ophth., 1929, v. 2, Sept., pp. 288-299.

Periarteritis nodosa is characterized by nodular thickenings of various sizes in the walls of small and medium sized blood vessels. It is the result of an inflammatory process. The characteristic appearances are great inflammation of the adventitia, with neutrophilic and eosinophilic leucocytes, with a greater or less number of small lymphocytes and plasma cells. Destruction of the muscle of the media may result in rupture and hematomas or false aneurisms. The intima in some cases remains unaltered, in others it contains masses of fibrin and hyaline material. Epithelioid cells are also found in the adventitia. The mesenteric, renal, hepatic, pulmonary, and cerebral vessels, with those of the skin and extremities, are most frequently involved. Myocardial fibrosis results from disease of the coronary arteries. Hemorrhagic nephritis, rupture of cerebral arteries, and peritonitis are also present. It usually occurs in young people. It is no longer considered to be syphilitic. The lesions in the eye have not previously been described.

The present paper gives numerous microphotographs of the ocular vessels. The changes there present are similiar to those found elsewhere. There is a peculiar change of the media by which it is thinned down to a narrow fibrous ring which the authors call a piston-ring-shaped media. In the choroid, the predominating inflammatory cells are lymphocytes, large mononuclears and plasma cells, while the predominating type elsewhere in the body is the lymphocyte. A less severe and more chronic form of infection of the choroid is indicated by this monocytic preponderance. *M. H. Post.*

Holloway, T. B., and Fry, W. E., **Asteroid hyalitis: report of a case with microchemical and histologic observations.** Arch. of Ophth., 1929, v. 2, Nov., pp. 521-528.

Asteroid hyalitis was the name given by Benson in 1894 to bodies found in the vitreous that had the appearance of stars on a clear night. They have also been called snowball opacities and scintillatio corporis vitrei. Verhoeff concluded that these balls "consisted chiefly of calcium soap, probably calcium margarat, possibly admixed with insoluble compounds of cholesterol and lecithin," associated with marked sclerosis of the choroidal arteries. He felt that angiosclerosis was important in the etiology. Bachstez thought the opacities were fatty acid and lime, the fatty acid being palmitic or stearic acid. He did not find angiosclerosis.

The authors concluded there was a carbonate, and that phosphate was present only in normal amounts. That calcium was present was indicated by the presence of typical calcium sulphate crystals. A fat was present, but oleic acid or an oleate was absent. The fat was, therefore, either a palmitate or a stearate, or both. Free lipoids were excluded by the lack of double refraction, but double refraction after treatment with dilute acids indicated the presence of lipoid in combination. Finally, the light blue stain with Nile blue sulphate suggested the presence of a soap.
M. H. Post.

Jourdan, Henri. **Retinal edema caused by electric shock.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 725-727.

A line man seized a live wire in one hand. He felt a tremendous shock but was not rendered unconscious nor was he burned. He noticed immediately that

he was blind in one eye. The following day sight began to return. There was a scotoma in the upper half of the central field and a cap-like paracentral scotoma above this. Red vision appeared normal but blue was mistaken for green and green for yellow. The condition improved and there was a return to normal in three months.

Lawrence Post.

Lange, Fritz. **Hemorrhages in the fundi in hypertension.** Arch. of Ophth., 1929, v. 2, Nov., pp. 551-554.

By seven clinical tests pure hypertension can be distinguished from pure arteriosclerosis. All these tests show an increased reactability of the vessels in hypertension and a decreased reactivity in arteriosclerosis. Pure hypertension is said to be present if the blood pressure, both systolic and diastolic, is constantly high, if no arteriosclerotic changes are present in the peripheral arteries, and if involvement of the kidneys is absent. Pure arteriosclerosis is connoted by pathological findings in the large and small arteries, with the blood pressure normal or below normal. Sixty cases of retinal hemorrhage were studied. Fifteen of these had pure hypertension without arteriosclerosis. Forty showed both hypertension and arteriosclerosis. In the balance the cause of the hemorrhages could not be determined. Hemorrhages never occurred in pure arteriosclerosis. In cases of hypertension, there often occurred differences in caliber and tortuosity of the vessels, but these vascular changes were also found in arteriosclerosis. Subconjunctival hemorrhages appear to have a similar etiology. Cerebral apoplexy is frequently found with such retinal disturbances, and usually arises from the capillaries, as do the small retinal hemorrhages that do not appear to be in relation with any vessels.

M. H. Post.

Rifat, A. **Spasm of central artery of retina.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 711-715.

Two cases are reported, each in a healthy young man. Vision was never entirely lost but was reduced to one-tenth in one case and to two-tenths in the other. Retinal vessels were contracted, papillæ were pale. In one case there was a patch of exudate near the disc. Treatment consisted in retrobulbar injections of atropin and later atropin by mouth. Gradual improvement took place but in one case was never complete, eight-tenths being the maximum vision and there remaining also a slight pallor of the disc. The author stresses the retention of a small amount of vision throughout the attack as a differential point between spasm and embolism of the central artery.

Lawrence Post.

Sédan, Jean. **Temporary blindness from retinal angiospasm associated with swamp fever.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 705-711.

A case was observed with the ophthalmoscope almost from its onset following ingestion of one gram of quinine. Arteries were mere lines; fundus reflex was a pale rose; veins and disc were slightly congested; tension was very low. Vision began to return on the third day. The field was much constricted and corneal sensibility was diminished. By the seventh day, ocular tone, fields, and central vision were normal, and normal corneal sensation had returned. The arterial current slowly returned and the appearance became entirely normal. Treatment toward rapid relief of the spasm had not availed.

Lawrence Post.

Wolff, E., and Davis, F. **Fragmentation of the retinal blood stream.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, pp. 143-149.

Fragmentation or segmentation of the retinal blood stream is described and illustrated. The method of producing the condition in laboratory experiments on the cat is fully described. After mention of the possible explanations of the phenomenon, the authors reach the conclusion that fragmentation of the blood stream is best explained by the symptom known as aggregation.

To produce the phenomenon known as aggregation, it is presumed that the lipoid substances contained in the capsules of the red blood corpuscles impart a certain greasiness to the surface and tend to make the corpuscles run together. The result of this surface tension is that the corpuscles have a strong tendency to become agglutinated into rouleaux and clumps when the blood is at rest. But if the blood be disturbed the aggregated corpuscles are readily separated, whereas true blood coagulation is an irreversible process.

The description of the phenomenon and the explanation advanced should be of interest to those ophthalmologists who have been fortunate enough to observe a similar condition in spasm of the central artery of the retina.

A. B. Bruner.

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Alvis, B. Y. **Amaurosis following ingestion of ethylhydrocuprein: report of a case.** Arch. of Ophth., 1929, v. 2, Sept., pp. 328-332.

Amaurosis from ethylhydrocuprein is a subject of increasing interest because of its growing use in the treatment of pneumonia. On that account, the author reports a case coming to his attention recently. During the course of three days, the patient was given fifty-eight grains. The third night the temperature went to 104 and she was somewhat irrational. The following morning, she was unable to distinguish light. The pupils were widely dilated and fixed. The disks were very pale, the margins blurred and the retinal arteries practically obliterated. The veins also were practically threadlike. There was a cherry-red spot in the macula. The vision gradually improved. Thirteen weeks later she could count fingers at eight feet with either eye and the field was fairly wide. The disks remain pale and sharply outlined and the arteries and veins were threadlike. The cherry-red spot in the right macula had disappeared. De Schweinitz decided that the drug had a selective action on the optic and auditory nerves. No treatment apparently influences the condition, though a certain amount of recovery takes place automatically. Some permanent disability, however, follows even mild cases of poisoning.

M. H. Post.

Del Duca, M. **Anatomic researches on the optic canal.** Riv. Oto-Neuro-Oft., 1929, v. 6, May-June, pp. 216-237.

Ninety skulls, selected from the rich collection of the Institute of Legal Medicine of Rome, were examined by the author with special regard to the optic canal and its neighboring structures. From his findings, which are tabulated in detail, he comes to the following conclusions: The optic canal gets its canalicular shape early in life and reaches its average length of 7.5 mm., which is the length of its inferior and shortest wall, at from ten to eleven years of age. The carotid artery, whose groove is visible in the body of the sphenoid, affects the development in length of this wall, while the ophthalmic artery molds the shape of the internal and external orifices of the canal. The axes of the canal, prolonged backwards, meet the internal wall of the skull at a point situated 7.5 cm. above the apex of the mastoid and 3.5 to 4 cm. behind its anterior margin. The internal wall of the canal was found perforated in many skulls, and the canal communicating freely with the neighboring sinuses. Anomalies of the sphenoid bone and of the skull in general affect the relative position of the internal orifices of the canals, while the distance between the orifices is affected by brachycephaly and dolichocephaly. A high and thickened quadrilateral lamina, unilateral or bilateral clinocarotid or clino-clinoid canals, either complete, or incomplete, and malformations of the canal derived from the passage of the ophthalmic artery are findings frequently observed. The findings in macrocephaly and microcephaly, in acrocephaly and scaphocephaly, are similar to the findings of other skulls. (Bibliography.)

Melchiore Lombardo.

Pedrazzini, F. **Choked disc.** Riv. Oto-Neuro-Oft., 1929, v. 6, May-June, pp. 195-214.

The author injected different amounts of solution of methylene blue into the cranial cavity of a dog and of several cadavers; and also into the optic nerves of calves. From the results of these experiments he concludes that no communication exists between the retina and the arachnoid cavity. In another series of experiments in living dogs he increased the intracranial pressure by injecting paraffin into the cranial cavity through different points of the skull. The ophthalmoscopic examination performed at the same time revealed a rapid engorgement of the retinal veins, a contraction of the arteries and some swelling of the disc. At necropsy the paraffin was found amassed in different parts of the dural space and brain. Closure or diminution in size of the cavernous sinus, into which the central vein of the retina sometimes opens, was also observed. The same condition was noticed in the other venous sinuses. The author states that the engorgement of the retinal veins is a result of stasis in the central vein, which cannot empty freely into the cavernous sinus. The increased intracranial pressure causes also the compression of the encephalic-medullary arterial system, which, together with the increased resistance to the blood circulation, due to the same cause, explains the contraction of the ophthalmic artery and of its branches in the retina, as shown by the ophthalmoscope. The swelling of the disc must be considered a consequence of the blood stasis in the retinal veins and also of the pressure on the scleral ring by the fluid which is kept under pressure in the nerve sheaths. The author concludes that the choked disc is a symptom of the disturbed function of the hemo-hydraulic system exclusively. It depends upon the increase of pressure of the cerebro-spinal fluid and on the amount of solid content in the dural sac; also upon the integrity of the cerebro-spinal hemo-hydraulic system and upon the anatomic disposition of the central vein of the retina: whether it opens into the cavernous sinus and empties exclusively into it, or whether it opens into the superior or the inferior ophthalmic vein and empties, through these, into the facial or the internal maxillary veins. (Bibliography.)

Melchiore Lombardo.

Rifat, A., and Mouhiddin, F. **Loss of vision with serous meningitis.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 715-722.

A case in a twenty-five-year-old woman is reported. The visual failure followed la grippe. Blindness was present after two days. There was a choked disc of five diopters in one eye and three in the other. All tests were negative. Spinal puncture showed fluid under great pressure. This did not help the eyes, so a cerebral decompression was necessary. The eyes quickly began to recover and the patient to improve. Complete recovery followed three milk injections. The underlying cause was taken to be a serous meningitis of influential origin.

Lawrence Post.

12. VISUAL TRACTS AND CENTERS

Beauvieux. **The true origin of the oculomotor nerve in the cat.** Arch. d'Opht., 1929, v. 46, July, p. 401.

The hypotheses as to the nuclei of origin of the oculomotor nerve are discussed and it is pointed out that nothing definite can be shown as to the nucleus of the ciliary fibers. Serial sections were made of the mesencephalon of a cat. They were then treated by the method of Golgi and Cajal and examined. Detailed examination of the sections is described, and the conclusion is reached that in the cat the nucleus of origin of the oculomotor nerve resembles that described by Bechterew in man. It was expected to find a nucleus for the ciliary portion of the nerve in the cat, as the pupillary movements predominate over the extraocular movements. However, it was impossible from anatomical preparations to solve the problem as to the origin of the ciliary fibers, and the only definite conclu-

sion made was that such fibers exist even though their site of origin is indefinite. *M. F. Weymann.*

Beauvieux, Piéchaud, F., and Rudeau, C. **Angiospasms involving the optic tracts.** Jour. de Méd. de Bordeaux, 1929, no. 18, June 30, p. 519.

Two cases of vascular spasm involving the optic tracts are described and the anatomy and physiology of the condition are discussed. Three arteries, the anterior choroid, the sylvian, and the posterior cerebral, supply the optic tracts and cortex. Spasm of the first may produce a hemianopsia, due to ischemia of the external geniculate bodies, which may be accompanied by a hemiplegia or a hemianesthesia. When the sylvian artery is involved an inferior quadrant defect may result, or, if the branch supplying the anterior bundle of the radiations of Gratiolet is in spasm, complete hemianopsia will occur. Spasm of the posterior cerebral artery will involve the inferior bundle of the optic radiations and will result in a superior quadrant defect, but if the calcarine branch of this artery is at fault disturbance of the subcortical radiations and of the calcarine cortex will occur, which if severe will cause a complete hemianopsia, but if mild, only hemianopsic scotomas. Ordinarily the prognosis is good, but occasionally the ischemia may lead, by its persistence, to permanent trouble. Treatment is antispasmodic, dietetic, and opotherapic.

Phillips Thygeson.

Blakeslee, G. A. **Eye manifestations in fracture of the skull.** Arch. of Ophth., 1929, v. 2, Nov., pp. 566-572.

The problem in fractures of the skull is largely neurological. From his study of such cases, Martin Cohen concluded that inequality of the pupils, combined with loss of the light reflex, was common in fatal cases and that fundus disturbances were infrequent. In the author's series of 610 cases, 78 per cent manifested eye signs. These eye lesions were divided into the following groups: (1) ecchymosis and hemorrhage in the lids and conjunctiva; (2) paralysis of extrinsic eye muscles, including ptosis; (3) nystagmus; (4) pupillary phenomena; (5) scotoma; (6) changes of the fundus and of the optic nerve.

Ecchymosis and hemorrhage into the lids and conjunctiva are very suggestive of fracture of the skull, especially if other eye signs are present. Edema and swelling frequently do not appear for several hours and ecchymosis not for a number of days. Conjunctival hemorrhages are less frequent and usually appear on the temporal side. Lid and conjunctival signs appeared in 17 per cent of all cases, and 28 per cent of these had other ocular symptoms. Twenty per cent of this group died.

The second group, comprising thirty-five cases in all, showed many different lesions, including partial or complete ptosis and involvement of the extrinsic eye muscles, resulting in strabismus, monolateral or bilateral. There was also involvement of the constrictor pupillæ. Diplopia was frequent. Forty-three per cent of these patients died.

Nystagmus was seen in thirteen cases. It varied in its characteristics, but appeared early. Thirty per cent of these patients died.

Pupillary disturbances were considered very important and the most constant signs in fractures of the skull. Observations were made from once every other day to four or five times each day. Changes came on immediately following the injury, but were surprisingly inconstant. Three hundred and seventy-eight patients showed these changes and of them about 47.5 per cent died. The types of disturbance were grouped into eight subdivisions:

(1) Widely dilated pupils with fixation. Such a condition usually followed immediately after the injury, though in some cases twenty-four hours was necessary for its development. Of the fifty-five patients with such pupils, 94.5 per cent died.

(2) Widely dilated pupils, reacting however to light. Most such cases recovered normal pupils, but in some the pupils later became fixed and death supervened.

(3) Dilated and fixed pupil on one side only. This sign has been supposed to indicate an epidural hemorrhage on the side of the dilated pupil, and in this series four such cases have been proven at autopsy, but other authors have found the contrary true and have found the sign in subdural hemorrhages, and again others have found the sign on the opposite side in subdural hemorrhage from contrecoup.

(4) Pupils equal and about normal in size. In this group the pupils were irregular and the light reflex was very sluggish.

(5) Unequal pupils of about normal size. This was the most common finding at the first examination and usually remained for a long time. The outline was slightly irregular.

(6) Contracted and fixed pupils. These were less frequent, but the mortality was high, 70 per cent.

(7) Contracted, but not fixed, pupils. These pupils soon returned to normal. They were more frequent than the former group.

(8) Partial Weber's syndrome—that is, a palsy of the third nerve with contralateral hemiplegia. This was never complete and but 8.5 per cent died.

Scotoma and changes in the fundus were rare. The most frequent change was slight engorgement of the veins. In only one case was a papilledema made out and then on the side of the fracture. Occasional visual and field defects were noticed. In some cases optic atrophy was seen. Thirty-nine per cent of the eighteen patients in this group died.

As a general rule, those patients showing eye signs had a poorer chance for eventual recovery than those without eye lesions. *M. H. Post.*

Young, C. A. **Homonymous hemianopsia during pregnancy aided by reflecting prism.** Arch. of Ophth., 1929, v. 2, Nov., pp. 560-565.

Homonymous hemianopsia is a rare complication of pregnancy. Vascular lesions, hysteria, and pregnancy have been considered as the three etiological agents. It is well known that the macular bundle escapes in many cases, and the explanation for this was sought in the idea of a bilateral representation of either macula. But it has been shown that damage to one or both occipital poles resulted in a homonymous paracentral scotoma extending right up to the fixation point, or a bilateral central scotoma. It is also known that blocking of the posterior cerebral artery results in homonymous paracentral scotoma. Holmes and Lister explain these facts as the result of a double circulation at the occipital pole, from the posterior and middle cerebral arteries.

The author cites a number of cases of bitemporal hemianopsia from macular lesions, speaks of the disagreement with regard to the part played by hysteria, and then reviews a number of reports concerning changes of the field of vision following pregnancy. The general opinion is that bitemporal shrinkage does occur in about 80 per cent of all cases, probably due to the normal hypertrophy of the pituitary gland. Other disturbances are also reported.

Prisms have been used for alleviation of the disability produced by permanent homonymous hemianopsia. Braunschweig uses prisms up to eight degrees, as did Strebel. Wiener used small isosceles right-angled triangles, the hypotenuse acting as a plane mirror over one eye only, the left in a left lateral hemianopsia, and vice versa.

The author concludes that permanent homonymous hemianopsia is probably the result of vascular spasm; that pregnancy has not been established as a causative factor; that the visual cortex receives part of its blood supply from the middle cerebral artery, and that the macula does not have a bilateral representation in the cortex; that marked improvement in adaptation takes place; that a reflecting prism gives great comfort and that the upper and lower surfaces of this prism should be frosted to avoid interference by spectral colors.

M. H. Post.

13. EYEBALL AND ORBIT

Seale, E. A. **Exophthalmos and mixed astigmatism caused by large ethmoid mucocele.** Brit. Jour. Ophth., 1929, v. 13, Oct., p. 503.

A man, aged twenty years, had a left side mucocele of four years' duration. Its inception could possibly be traced to an attack of influenza ten years previously. The vision of 6/36 was improved to 6/5 following operation and the use of mixed astigmatic lenses. The author was fortunate in having a record of the patient's refraction at the age of fourteen years. At that time it was + 1.00 sph. + 0.50 cyl. axis 180°. (Two illustrations.) *D. F. Harbridge.*

14. EYELIDS AND LACRIMAL APPARATUS

Magnasco, M. **Prelacrimal tumors.** Saggi di Oftalmologia, 1928, v. 4, p. 339.

Various forms of cysts, more rarely true tumors, and pseudotumors make up that group of growths called by various authors prelacrimal tumors. Among the cysts are those whose contents class them as serous, sebaceous, fatty or oily, and dermoid.

In this class should be included swellings formed by subcutaneous collections of fluid due to phlegmonous inflammation, which are comparable to and simulate dacryocystitis.

Mention is made of tumors reported by other investigators, usually cystic, in one case cystoadenomatous, which had no communication with the lacrimal sac.

In recent years some prelacrimal cysts have been considered as diverticula of the lacrimal sac which had been completely shut off from the sac, as anomalies growing from embryonal rests, or as progressive growth of serous or mucous glands in close vicinity to the sac. These cysts are the deeper ones, not those having an ectodermal basis.

The author has observed three cases of prelacrimal tumor. The first case was that of a serous cyst, the size of a large hazel nut, whose walls infiltrated the floor of the orbit. This cyst probably had its origin in a diverticulum or gland of the sac.

The second case was that of a small serous cyst, immediately under the skin and overlying the sac. It was assumed that this arose from an aberrant tubular sudoriferous gland.

The third case was one of a pseudotumor anterior to the sac. The mass was the size of a small bean, hard in consistency, nonfluctuating, and slightly movable upon the underlying tissues. There were no symptoms referable to trouble in the lacrimal system. Microscopically the mass showed the presence of muscular bundles intermingled with new fibrous connective tissue. Its origin was thought to be an insect bite which had caused a myositis of the orbicularis. *F. M. Crage.*

Nida, M. **New operation for congenital ptosis.** Ann. d'Ocul., 1929, Aug., v. 166, pp. 639-645.

After anesthesia, the upper lid is everted; a horizontal tongue of conjunctiva, connective tissue and tarsus is dissected free at the level of the fold in the everted lid. The superior rectus is exposed and the tongue passed under the muscle. The free end of the tongue is then sutured in its former place. One case with illustrative photographs is given. *Lawrence Post.*

Poos, F. **On the disturbance of lid closure and opening in exophthalmic goiter.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 242-264. (8 ill.)

From his critical discourse on the different theories and his clinical and experimental investigations Poos concludes that the extant explanations are based on correct initial observations, but that it is not possible to bring all symptoms in consecutive dependence upon one chief symptom as various authors teach. In exophthalmic goiter different processes and conditions are combined or influence one another in producing the lid symptoms. All kinetic, static, and mechanical factors for maintaining the physiological width

of the palpebral fissure are changed in Graves's disease and contribute to the peculiar lid symptoms. Central (subcortical) stimulation leads to enlargement of the palpebral fissure, giving the expression of fear or surprise. Kinetic causes of widening are: (1) nonautonomous, by disturbed relationship between levator (oculomotor nerve) and orbicularis (facial nerve), hence contraction of levator with simultaneous relaxation of orbicularis; (2) autonomous, by spontaneous increase of the widening effect of the smooth lid muscle with relaxation of the antagonistic orbicularis plus tonus of the smooth muscle apparatus (sympathetic). The mechanical causes are (3) passive widening by the exophthalmus, and (4) decrease of gravitation from the more or less horizontal position of the upper lid. The static cause is fixation of the enlarged palpebral fissure, by the spreading function of the tonus of the smooth lid muscle apparatus.

C. Zimmermann.

Truc, H., and Dejean, C. **Median blepharotomy in the form of a reverse V, to permit vision in an occluded eye.** Arch. d'Opht., 1929, v. 46, July, p. 397.

A patient, seventy years old, had lost the sight of the right eye through a perforating wound at the age of eighteen years. The left eye was involved in a mass of scar tissue extending from the ala of the nose to the external canthus. This scar had been produced by the use of radium in the treatment of a carcinoma. The globe was practically fixed, with the cornea turned upward, and the palpebral fissure was so narrowed that the patient could only see by tilting the head back and stretching the upper lid with the fingers. The cornea was in good condition. A vertical incision one centimeter in length was made through the entire thickness of the upper lid over the pupil. The skin was united to the conjunctiva so that a new palpebral fissure in the form of an inverted V was made. This allowed for vision and yet was closed sufficiently to protect the cornea by the action of the orbicularis. Two years later the slit was lengthened because of increased scar. Photographs accompany the article.

M. F. Weymann.

Williams, C. M. **Dermatoses of the region of the eye.** Arch. of Ophth., 1929, v. 2, Oct., pp. 443-451.

Some of the commoner dermatoses of the region of the eye are considered, and methods of treatment are suggested.

Pigmented nevi. As malignancy is rare, treatment is directed toward cosmetic results, but it should be radical. If hairs are present they should be removed first by electrolysis. The same applies to vascular nevi. Radium may leave telangiectasia in the flat, rather pale, superficial type.

Impetigo contagiosa frequently accompanies pediculosis capitas. The appearance resembles that found elsewhere. It yields to removal of the crusts and application of from 5 to 10 percent ointment of ammoniated mercury.

Eczema. Protection is of the utmost importance, by soothing applications such as Lassar's paste, and over this a mask of gauze. Food allergies play a part in some cases. In adults the eyelids are frequently the site of predilection and the disease may remain there long after other portions of the face have cleared up. The eyelids are "swollen, leathery, brownish red, often slightly scaly, and often itch severely." Calamine lotion, Lassar's paste, or an ointment with oil of cade or coal tar is of value. Small amounts of arsenic in the blood may be a contributing factor.

Seborrhea and rosacea. The former should be combated by cleanliness, the second by attention to diet and soothing applications.

Molluscum contagiosum. This condition is due to an ultramicroscopic virus. Small, warty-like elevations increase to round, pearly, translucent masses two to three millimeters in diameter. The individual lesion should be pricked.

Lupus erythematosus. The usual site is the nose and cheeks, with slight involvement of the eyelids. The lesions are dry, sharply outlined, reddish plaques, usually covered with scales, with a number of filiform projections on the inner surface. It yields in the majority of cases to gold and sodium thiosulphate.

Lupus vulgaris is due to localized colonies of tubercle bacilli in the skin. It starts with brownish red, translucent nodules from one to two millimeters in diameter. Ulceration usually follows, with the production of thick scars which contract and result in great deformity. No treatment is suggested.

Leprosy. One of the earliest lesions of the nodular type is the appearance of firm masses in the skin in and above the eyebrows, and at the same time in the lobule of the ear. In the early stages chaulmoogra oil results in arrest of the process.

Syphilis may appear as a chancre of the conjunctiva. Later the usual secondary lesions may be present on the lids.

Alopecia areata may result in loss of eyebrows and lashes. Removal of foci of infection is recommended, and locally treatment with ultraviolet light or crude phenol.

Leukoderma is an absence of skin pigment. Treatment is useless.

Zoster is an infection involving the ganglion of the nerve root and runs a self-limited course. Treatment consists in protection of the lesion.

Xanthelasma. This lesion is composed of lipids, including cholesterol. There is no danger of malignant degeneration. Monopolar fulguration is recommended. The lesion should be lifted from the subcutaneous tissue by curved forceps.

Xeroderma pigmentosum appears as brownish patches which become warty and may undergo malignant degeneration. Protection against light and treatment with radium are recommended.

Senile keratosis is the name given brownish, rough or warty plaques on the skin of face or hands of old people, with occasional malignant degeneration.

Epitheliomata usually occur near the inner canthi. They are commonly of the basal cell type. A small, hard, pearly nodule appears, and enlarges after taking the form of a plaque with depressed center. Later ulceration with a depressed center takes place. It does not tend to metastasis, but serious destruction of skin, cartilage, and bone may result. Radium in large doses should be employed. *M. H. Post.*

15. TUMORS

Barletta, Vincenzo. **On perithelioma of the limbus.** Ann. di Ottal., 1929, v. 57, April-May, p. 400.

There has been much confusion concerning endothelial neoplasia. Today we have more precise knowledge of their embryological origin, whether they be the lining membranes of the serous cavities or of the vascular system. Since we know that these are derived from the mesoblasts there can be no difficulty in distinguishing endothelioma-connective tissue growths, from carcinoma-epithelial tumors. The case described is a rare form of corneal neoplasm.

In a peasant of fifty the anterior surface of the left eyeball was nearly covered by three fleshy excrescences which involved the greater portion of the bulbar conjunctiva and of the cornea. The larger of these took its origin from a narrow pedicle arising from the limbus and covering the upper and inner portion of the sclera. The surface was smooth, glistening, of a reddish yellow, gelatinous appearance and the size of a small bean. The two other growths were smaller, extending 3 to 4 mm. over the cornea, and took their origin below, and below and externally. The center of the cornea was not involved, the vision normal. Because of its good condition the ball was not enucleated as in other cases reported, but the growths were removed. Within the tumors was a hyaline substance. The capillaries in the tumor were formed of a single stratum of endo-

thelium without any proliferations whatever. The author discusses in detail its morphology and urges biopsy in such cases, as peritheliomata are relatively benign and nonrecurrent.

Park Lewis.

Barrière and Malet. **Primary lymphosarcoma of the conjunctiva.** Arch. de Oft. de Buenos Aires, 1929, v. 4, July, p. 409.

The patient was a man aged forty-seven years, who presented a swelling of the right bulbar conjunctiva, that almost surrounded the cornea. Its surface was smooth, uniform, and pink. The cornea was entirely normal, although it was necessary to lift up the tumor mass in order to see the limbus. There was no secretion and no pain. The preauricular gland was slightly enlarged.

The mass was extirpated without difficulty, as there was no scleral or corneal attachment. The base showed no alteration. The diagnosis of lymphosarcoma was made immediately from the frozen section, and the area was given considerable x-ray treatment. Following this the preauricular enlargement disappeared. When the patient returned one month later, another tumor mass was found in the same place and of the same general appearance, but upon section it was shown to be inflammatory in origin, and probably a resultant of the intensive radiation. The original tumor mass was found attached to the conjunctiva by a slim pedicle. There was no limiting membrane, and the growth consisted of an intense lymphocytic infiltration, the individual cells showing very little cytoplasm. As no other attachment or origin could be demonstrated, the mass was classified as a primary lymphosarcoma of the conjunctiva.

A. G. Wilde.

Benedict, W. L. **Retinoblastoma in homologous eyes of identical twins.** Arch. of Ophth., 1929, v. 2, Nov., pp. 545-548.

In this paper the author presents the first report of neuroblastoma in homologous eyes of identical twins. The tumors in the left eyes occurred in similar situations, indicating that they arose from fetal rests in the single ovum. One child died four months after operation. The other child, who had tumor growths in both eyes, recovered following removal of one eye and treatment of the other by repeated applications of radium. Several applications were used each year. At ten years of age cure was completed, but a posterior cortical cataract was developing, probably as a result of the choroidal lesion and the radium applications.

M. H. Post.

Doherty, W. B. **Choroidal melanomas.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 309.

Certain pigmented tumors exist in the choroid which are surely benign growths. It is of great importance seriously to consider the means at hand and the warning signs by which we are able to tell just when these areas become malignant, if they ever do.

The term "circumscribed melanoma of the choroid", first proposed by Cattaneo, seems to be the best term descriptive of these abnormalities, but, to be more specific, the present writer suggests "congenital circumscribed melanomas of the choroid".

E. G. Lear.

Gifford, H. **Recurrent dermoid cyst.** Arch. of Ophth., 1929, v. 2, Sept., pp. 305-306.

The author reports a dermoid cyst, with numerous diverticula, which lay in the upper portion of the orbit and which he opened and scraped out and packed with gauze. After twenty-four hours the gauze was removed and the orbit was scrubbed with trichloracetic acid and repacked. Three days later this process was repeated and further pockets were found. The body of the cavity was then filled with thymoliodide and the patient sent to his physician.

The author notes that the great advantage of trichloracetic acid is that it is efficient and harmless. There is no danger of going too deep. If, however,

a portion of the wall of such a sac can be removed, it is better to do so before applying the trichloracetic acid to the remainder. *M. H. Post.*

Heckel, E. B. **Complete exenteration of the orbit by means of electrocautery for neglected epithelioma of the eyelids: report of a case.** Arch. of Ophth., 1929, v. 2, Nov., pp. 549-550.

A rodent ulcer, involving the entire orbit and lids with the exception of a portion of the lower lid, was operated on by the electrocautery knife. The skin about the ulcer was cauterized. Next a series of multiple punctures directed toward the apex of the orbit were made with the electrocautery at a cherry-red heat. Keeping close to the orbital wall starting on the nasal side, and sacrificing the remaining portion of the lower lid, the entire orbital contents, including the globe, were removed. Afterward the walls were seared over with a red hot electrocautery. There was almost no bleeding. The wound was then dusted with boric acid powder and dry gauze was placed over it. *M. H. Post.*

Judd, J. H. **Primary squamous-cell carcinoma of the cornea.** Arch. of Ophth., 1929, v. 2, Aug., pp. 132-137.

The author has collected the reports of twenty cases of carcinoma of the cornea and adds one more to this number. The growth involved the superficial layers of the cornea only and was confined to the periphery, where it formed a complete annular neoplasm. The eye was enucleated and was examined by Major George R. Callender, who reported an epithelioma arising from the corneal epithelium. Its ring shape was unique. *M. H. Post.*

Knapp, Paul, and Lüdin, Max. **Glioma of the retina cured by roentgen rays.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 279-284. (2 col. pl. 2 tables.)

A girl born August 30, 1921, presented in November, 1922, glioma of the left retina, filling the whole vitreous chamber. On November 21, 1922, enucleation was performed. On January 10, 1923, the ophthalmoscope disclosed a grey tumor, double the width of the disc, in the temporal region of the fundus of the right eye between two veins. At first it was treated with radium and then with roentgen rays (the technique is described in detail), and after a year was distinctly smaller. After a further year the tumor was smaller still but lesions resulting from the treatment appeared; a defect of the temporal portion of the eyebrows, scanty lashes, telangiectasis of the skin, expansion, tortuosity, and caliber differences of a temporal vein of the conjunctiva, and cataract. The cataract was removed by discission, so that on January 15, 1929, an ophthalmoscopic examination was possible. The tumor had completely disappeared, its former site looked like an old choroiditic focus. Vision with correction was 0.7, the visual field normal. *C. Zimmermann.*

Lamb, H. D. **Contribution to the pathologic anatomy of siderosis bulbi.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 161.

Two cases harbored steel particles in their eyes for various lengths of time, two cases had intraocular hemorrhages without any foreign body, and one had a foreign body with hemorrhages. The pathologic examination showed that there was much less iron pigment in the two cases of hemorrhage than in the two cases with the foreign body. The author further concludes that almost all the ocular structures showing any appreciable amount of iron-bearing pigment, with the exception of the ciliary muscle, are ectodermal in origin.

In discussion, Zentmayer brought out that Mayou in his investigation of the subject had stated that organic iron was always present in the form of a colloid, and that the endothelial cells almost always escaped election, but that the epithelial cells had an elective affinity for this iron and that iron in the form of a colloid could not get into the lens unless there was a break in the capsule. *E. G. Lear.*

Tooke, F. T. **Melanotic sarcoma of the choroid with probable cerebral metastasis.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 303.

The author reports a case of cataract with a high degree of glaucoma complicated by diabetes. After examination, he suspected some tumor in the eye, made an enucleation, and had an histologic examination performed. A relatively small, mushroom-like growth was noted on the temporal side, not far from the nerve head. The tumor was small in size, stained deeply with hematoxylin-eosin, was composed largely of sarcoma cells, was definitely melanotic in character, and was richly supplied with blood vessels.

About a year later the patient returned complaining of headaches. There was a small tumor mass of grayish blue appearance in the stump of the eye in the conjunctival cushion.

An exenteration of the orbit was performed. The tumor had no deep attachments. Deep applications of x-rays were given and the patient returned home. At the end of a year he died, suffering from continuous headache. The pathologic examination of the orbit showed a nodule composed of large spindle-cells.

A subsequent examination of the original tumor showed that the penetrating vessels at the base of the eyeball had regular masses of round cells, the veins being the more involved. A definite round cell mass was situated between the dural and pia-arachnoid coats of the optic nerve.

The sections showed that the tumor was a round-cell sarcoma, that it was melanotic in character, that it was vascular to a high degree and even hemorrhagic in some places, all points suggesting an unusual malignancy and an unfavorable prognosis. *E. G. Lear.*

16. INJURIES

Colrat. **Ocular lesions peculiar to the artificial silk industry.** Arch. d'Opht., 1929, v. 46, July, p. 416.

The nontraumatic lesions in this industry consist of a conjunctivitis and, when more severe, a superficial keratitis with the subjective symptoms of tearing and photophobia. The condition clears rapidly upon keeping the patient away from the workroom, with the use of cocain ointment and cold applications in the more severe type. The chief source of disturbance seems to be fumes of sulphuric acid products, and by proper ventilation the incidence is reduced. The viscose contains caustic soda, and when splashed into the eyes it produces caustic burns. All particles must be carefully washed out or removed and the formation of symblepharon avoided if possible.

M. F. Weymann.

Kalashnikov, V. P. **Protective measures for the prevention of injuries to the eye and to other organs in railway shops.** Russkii Opht. Jour., 1929, Aug., pp. 179-198.

In order to reduce occupational traumatism of the eye, which has increased in Soviet Russia to an alarming degree, the author advocates the following measures: preliminary training of workers in schools connected with large railway shops; thorough physical examination of students in these schools with a view of eliminating those unfit for the work; introduction of protective apparatus for the eyes and other organs; a study of similar prophylactic measures in other countries, particularly in the United States of America; general hygiene in work; propaganda among workers urging them to obey the rules established for the protection of their health. *M. N. Beigelman.*

Loddoni, G. **Ocular chalcosis—corneal chalcosis. (Ocular changes from copper.)** Ann. di Ottal., 1929, v. 57, April-May, p. 329.

By ocular chalcosis the author means the clinical picture and the anatomical and pathological alterations in the eye as a result of copper accidentally or experimentally introduced into the globe. The study is a very complete résumé of the subject. Copper is normally found in almost all of the animal tissues and is peculiarly susceptible to the

action of the body fluids. When introduced under the conjunctiva or in the globe it is readily diffused through the adjacent structures. It may be detected by chemical reactions in as small an amount as 1 to 1,000,000. Introduced under the conjunctiva it causes a moderate inflammatory reaction. If fixed in position under the conjunctiva it gives rise after a variable period of time from 20 days to 3 or 4 months to a vascular elevation. It may remain encapsulated for a long period without inflammatory phenomena. In corneal chalcosis a deposit is formed on the posterior surface in the form of a ring. As a diagnostic agent hematoxylin is peculiarly sensitive, showing the presence of as small an amount of copper as 1 in 400,000. If the particle is encysted in the conjunctiva and a few drops of a one per cent solution dissolved in cold water are dropped in the conjunctiva, a bluish reaction will follow. If the chip is in the anterior chamber or vitreous a few drops of the aqueous may be drawn off and deposited on a porcelain capsule. The addition of the hematoxylin will give the characteristic amethyst blue tint if copper is present.

Park Lewis.

Mamoli, L. **Chemical diagnosis of intraocular metallic foreign bodies.** Saggi di Oft., 1928, v. 4, p. 371.

In cases where objective, x-ray, magnetic, and sideroscopic examination might fail to demonstrate the intraocular presence of metallic foreign bodies, the author adds another diagnostic procedure, the chemical reaction of the aqueous humor to metals. The observations, therefore, are based on deep intraocular foreign bodies.

Aqueous is aspirated from the anterior chamber with a glass syringe and needle, and the second drawing placed in a chemically clean watch crystal. The second extraction of aqueous is used because the more active aqueous is likely to be more free from the iron albuminate than the less active vitreous, where the iron concentration is higher, and from the less active vitreous the anterior chamber then receives the iron present in the second drawing.

The author's modification of the Coppez method of subjecting the aqueous to treatment with nitric acid was used in case of iron particles. All the cases reacted positively. In the copper and brass cases, the aqueous was subjected to treatment with hydrosulphuric acid. All the cases reacted positively.

To be assured that other metals such as arsenic, bismuth, and mercury, used therapeutically in lues and other diseases, did not have reactions in common with iron, copper, and their alloys, the aqueous of patients under treatment with the former metals was subjected to the iron and copper tests. The reactions proved negative.

F. M. Crage.

Medwedjew, N. J. **Perforating injuries of the eyes.** Hirschmann Memorial Hospital Publications (Charkow), 1929, v. 1, p. 31.

The author points out a striking change in the relative importance of the factors causing blindness in Russia, where the number of blind is estimated at 300,000 (Golowin) to 500,000 (Braunstein). While in 1905 trachoma caused 21.4 per cent, glaucoma 19.2 per cent, smallpox 12.1 per cent, and injuries 3.7 per cent, in 1925 trachoma caused 17.97 per cent, glaucoma 6.7 per cent, smallpox 4.57 per cent, injuries 20.96 per cent of blindness. The rise of trauma as a factor is principally due to the intensive industrialization of Russia since the revolution, and the constantly increasing drafting into industry of new and unskilled elements from among the peasantry unaccustomed to working with machines. From 50 to 65 per cent of all industrial accidents are estimated to be due to carelessness of workers themselves. About 25 per cent are considered inseparable from industry, while the management is held responsible for 50 to 25 per cent. The greater registration incident to the increased facilities for treatment and to the operation of accident insurance laws, however, explains much of this

apparent increase of incidence of industrial accidents. Industrial injuries in general are less frequent than in Germany, although they are more frequent than in the United States. Depending upon the industry and the locality, injuries to the eyes range from 3.7 to 21 per cent of all industrial injuries, the higher figures occurring in the metallurgical industries.

Interesting figures regarding perforating injuries to the eyes at the Hirschmann Memorial Hospital are given. Of all eye cases seen, 5.9 per cent were injuries, and of those hospitalized for injuries, 72.1 per cent were for perforating injuries. The right eye was slightly more often injured than the left. Tetanus was never met with, although the wounds were frequently very dirty. Iron and steel particles were responsible for 40 per cent of the injuries. Explosions of bullets and other explosives accounted for 11.3 per cent. Glass particles were rare and those from breakage of lenses extremely rare. Glass was found well tolerated by the retina. About a third showed the foreign body in the eye; about a third of these involved the lens, and all such cases showed cataract; about a third showed inflammations of the uveal tract. Hirschberg's hand-magnet enabled the author to remove 50 per cent of all magnetic intraocular bodies. Of perforating injuries, 34.6 per cent led to immediate blindness, and 51.3 per cent ended in blindness eventually; 15 per cent retained useful vision (0.05 to 0.5 per cent), and only 4.3 per cent retained good vision (above 0.5).

Results of prophylactic work in one factory are shown by the following figures: In 1924 there were 119 eye injuries per 100 workers, and twenty eyes were totally lost. In 1925, after the introduction of protective goggles, there were sixty eye injuries per 100 workers, and ten eyes were totally lost. In 1926, twenty-one eye injuries were reported, including one serious injury, and in 1927 only three injuries, including one serious, were reported.

M. Davidson.

Roy, J. N. **A case of monocular blindness of electrical origin.** Brit. Jour. Ophth., 1929, v. 13, Oct., p. 490. (See American Journal of Ophthalmology, 1929, v. 12, Oct., p. 822.)

17. SYSTEMIC DISEASES, AND PARASITES

Barczinski. **A case of ophthalmomyiasis interna anterior.** Zeit. f. Augenh., 1929, v. 68, Aug., p. 353.

A foreign body which proved to be the larva of a fly, hypoderma bovis, was removed from the anterior chamber of the eye of a six-year-old child. Behr collected all the cases in the literature and found three in which the larva was in the anterior chamber and one in the posterior segment. It is usually the eye of a child that is involved, presumably because the larva can penetrate the relatively thin sclera. *F. H. Haessler.*

Bonnel, J. B. **A case of meningococcemia with ocular onset and consecutive purpuric, rheumatoid, irido-choroiditic, and meningitic forms.** Jour. de Méd. de Bordeaux, 1929, no. 19, July 10, p. 543.

Bonnel reports a case of meningococcemia, in which an initial keratoconjunctivitis was apparently the point of entrance of the organism. This was followed in turn by skin, articular, intraocular (iridochoroiditic), and meningitic localizations. There was at no time a nasopharyngitis, and pharyngeal cultures were uniformly negative. The organism is thus capable, like its near relative the gonococcus, of producing a primary infection of the eye, followed in turn by a septicemia with distant localizations. The iridochoroiditis is of metastatic origin, the mechanism of its production being explained by a septic thrombus or a microbic embolus. It has been reported in about 4 per cent of cerebrospinal meningitis cases, is generally unilateral, and is more frequent in children. *Phillips Thygeson.*

Cohen, Martin. **The eye in diabetes mellitus.** Arch. of Ophth., 1929, v. 2, Nov., pp. 529-539.

Ocular lesions occur in diabetes in from 20 to 30 per cent of all cases. Retinitis is the most frequent of these. Cataract, chronic retrobulbar neuritis, muscular disorders, changes of accommodation and of refraction, and iritis are found also. In young adults with advanced cases, lipemia and later coma occur. Hyperglycemia resulting from abnormal carbohydrate metabolism affects the ocular tissues. The author, with Killian and Miss Kamner, showed by experiment that the sugar in the eye rose synchronously with the blood sugar, but lagged behind the drop in blood sugar. Phosphorus poisoning and insulin also decrease the blood sugar. The ocular fluids resemble the cerebrospinal fluids in their relation to the blood condition in this respect.

Diabetic retinitis is frequently difficult or impossible to distinguish from renal and arteriosclerotic retinitis.

M. H. Post.

Goldbach, L. J. **Eye symptoms and the Parkinsonian syndrome.** Arch. of Ophth., 1929, v. 2, Nov., pp. 555-559.

The ocular changes following lethargic encephalitis are numerous and varying, or occasionally absent. Various toxemias may produce similar ocular disturbances and must be ruled out. The symptoms have been shown to be due to a nonpurulent polioencephalitis, sometimes associated with hemorrhages. There is probably a degeneration of the great basal ganglions, especially the optic and the corpora quadrigemina, in the aqueduct of Sylvius and the floor of the fourth ventricle. Other syndromes are noted: the mesencephalic syndrome with oculomotor paralysis and diplopia, and probably with disturbances of convergence and sleep; the metathalmic syndrome with ocular crisis, upward or downward; the luysian body syndrome, usually appearing as lateral deviation, and that of Toval's bundle with simple lateral deviation.

The ocular symptoms following encephalitis are: (1) ptosis and spasmodic retraction and relaxation of the orbicularis palpebrarum, bilateral or unilateral; (2) diplopia, crossed and homonymous; (3) rotary nystagmus with oscillation or quivering of the eye and retarded convergence; (4) paresis of external and superior recti and of the superior oblique; (5) paresis on looking upward, occurring at times only; (6) paralysis of convergence and accommodation; (7) anisocoria, temporary or permanent, with sluggishness of the pupillary reactions resembling the Argyll-Robertson pupil. In still other cases retrobulbar neuritis with its symptomatology may be present.

A tabulation of these cases studied at the Wilmer Institute is also given.

M. H. Post.

Judd, J. Hewitt. **Ocular lesions in tularemia.** Arch. of Ophth., 1929, v. 2, Sept., pp. 300-304.

Tularemia is a bacteremia of wild rodents. In man it is due to the bite of an infected animal, or to contamination of the hands or conjunctival sac from such animals. There are four types: (1) the ulceroglandular, (2) the oculoglandular, (3) the glandular, and (4) the typhoid. The diagnosis is made by agglutination of Bacterium tularense by the patient's blood serum. This reaction is absent during the first week, present during the second, and gradually increases during the third. The oculoglandular type presents multiple, small, discrete ulcers of the palpebral conjunctiva, having yellow, necrotic plugs, and indurated margins. The lids are chemotic and have a mucoid discharge. The lymph glands about the eyes are swollen and tender. The fever is intermittent. It resembles Parinaud's conjunctivitis, conjunctivitis infectiosa necroticans, sporotrichosis, blastomycosis and leptothrix infection. With the two cases reported by the author, thirty-four cases are now on record. Both these cases occurred from dressing of infected rabbits. Two cases of corneal involvement only have been found. A dendritic keratitis appeared in the second of the author's two cases.

M. H. Post.

18. HYGIENE, SOCIOLOGY, EDUCATION AND HISTORY

Friedenwald, J. S. **The modern ophthalmoscope; contributions to its construction and use.** Trans. Amer. Ophth., Soc., 1928, v. 26, p. 381.

In this thesis the author reveals the ophthalmoscope from its incipiency to the present day, including the giant ophthalmoscope of Gullstrand as well as the fundus camera of Nordenson. The following is the author's outline of his thesis:

(1) Introduction.
(2) The reflecting ophthalmoscope.
(3) The hand electric ophthalmoscope.
(4) Modern refinements:
  (a) Reflexless ophthalmoscopy.
  (b) Ophthalmoscopy with light of selected radiation.
  (c) Correction of the chromatic aberrations with a lens.
  (d) Ophthalmoscopic photography.
  (e) Ophthalmoscopic refractometry.
  (f) Slit-lamp microscopy of the eyeground. *E. G. Lear.*

Sédan, Jean. **The reactions of the trachomatous eye to industrial accidents in different occupations.** Rev. Internat. du Trachôme, 1929, v. 6, Jan., p. 7.

Sédan deplores the absolute lack of agreement between legal decisions and the testimony of medical experts in compensation awards for industrial accidents in cases of trachoma. There is no legal ruling permitting a distinction in a judicial way between the lesions of trachoma that might be considered as due to accident, directly or indirectly, and those lesions which are the complications of trachoma itself.

The author cites a number of ocular accidents seen by him over a period of eight years, referring especially to workers with the emery wheel, occupations in soap factories, and workers who scrape the hulls of ships in dry dock. In the first class there were fifty-two accidents to trachomatous eyes, from which there resulted but four cases of mild keratitis, and one case of aggravation of perfectly cicatrized trachoma. Evidently foreign bodies of rust and emery do not involve serious consequences in old trachoma.

Of twenty-two cases in which trachomatous eyes were burned by soapsuds and caustics, not one suffered reactivation or aggravation of the trachoma, in fact the action of the chemicals was beneficial.

The case of the workers in shipyards is somewhat different. Among these men, who are mostly foreigners, trachoma flourishes, and cases of foreign body in the cornea are particularly frequent, owing to the nature of the work. These foreign bodies are cold and quite infectious. In forty-seven accidents of this type, there were nineteen cases of severe recurrence of the trachoma; and, of these nineteen, fourteen received wages for the sixty or eighty days of their incapacitation, and eight finally received awards based on 10 to 20 per cent permanent partial disability. One case of old trachoma was awarded 20 per cent "for a chronic affection contracted before his industrial accident."

While the problem is not simple, it revolves entirely about the question of the antecedent state of the eye. It is wrong that the state should be called upon to compensate foreigners who exploit their "providential malady." All these cases should be submitted to the International Bureau of Labor of the League of Nations.

George H. Stine.

LUNCHEON PARTY DURING INTERNATIONAL
CONGRESS, AMSTERDAM,
September 10, 1929

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Amsterdam luncheon

Key list of those present at luncheon (during International Congress) for which invitations were issued by Dr. George F. Suker of Chicago, and which was also made the occasion for presentation of the Dana medal to Professor Ernst Fuchs. (See group portrait.)

(Unfortunately, it has been impossible to supply the names for some of those shown in the group portrait.)

1. Miss Maxwell, Dublin.
2. C. E. Shannon, Philadelphia.
3. H. McI. Morton, Minneapolis.
4. Lewis H. Carris, New York.
5. W. A. Parker, Detroit.
6. John W. Weeks, New York.
7. Frank E. Burch, Saint Paul.
8. V. Morax, Paris.
9. E. Hertel, Leipzig.
10. G. E. de Schweinitz, Philadelphia.
11. H. Coppez, Brussels.
12. Alan C. Wood, Baltimore.
13. Bailliart, Paris.
14. Terrien, Paris.
15. K. K. Lundsgaard, Copenhagen.
16. H. M. Traquair, Edinburgh.
17. W. H. Wilmer, Baltimore.
18. E. C. Ellett, Memphis.
19.
20. A. Marx, Leyden, Holland.
21. O. Kuffler, Berlin.
22. Karl Lindner, Vienna.
23.
24.
25. F. Park Lewis, Buffalo.
26. Clarence Veasey, Spokane.
27. George F. Suker, Chicago.
28. William Zentmayer, Philadelphia.
29. Fritz Ask, Łund, Norway.
30. M. Paul Motto, Cleveland.
31.
32. John Parsons, London.
33. Joseph Imre, Budapest.
34. Leslie Paton, London.
35.
36.
37.
38. Axenfeld, Freiburg.
39.
40. K. Wessely, Munchen.
41. A. Fuchs, Vienna.
42.
43.
44. R. Foster Moore.
45. E. Horniker, Trieste.
46. Emil de Grosz, Budapest.
47. V. Grønholm, Helsingfors.
48. Harry S. Gradle, Chicago.
49.
50. J. Bistis, Athens.
51. J. Meller, Vienna.
52. C. Pascheff, Sofia.
53.
54. Walter Lancaster, Boston.
55. Bernard Samuels, New York.
56. I. Schiøtz, Oslo.
57. W. Campbell Posey, Philadelphia.
58. W. H. S. Luedde, Saint Louis.
59. Emory Hill, Richmond, Virginia.
60. W. H. Wilder, Chicago.
61.
62. Fukala, Vienna.
63. Conrad Berens, New York.
64. Haab, Zurich.
65. Ida Mann, London.
66. George S. Derby, Boston.
67. Basil Graves, London.
68. E. V. L. Brown, Chicago.
69. Arnold Knapp, New York.
70. Joseph Urbanek, Vienna.
71. H. Barkan, San Francisco.
72. Krückmann, Berlin.
73. Arthur Bedell, Buffalo.
74. Melville Black, Denver.
75. A. Dalen, Stockholm.
76. William Lister, London.
77. R. Cords, Cologne.
78. Luther Peter, Philadelphia.
79. Adolph Barkan, San Francisco.
80. Von der Hoeve, Leyden.
81. E. Fuchs, Vienna.
82. Treacher Collins, London.
83. A. Bernard Cridland, Wolverhampton, England.
84. R. Seefelder, Innsbruck, Austria.
85. Birch-Hirschfeld, Koenigsberg (Prussia).

NEWS ITEMS

News items in this issue were received from Drs. E. M. Blake, New Haven; William B. Ebeling, Brooklyn; W. G. Gillett, Wichita; M. Paul Motto, Cleveland; James M. Patton, Omaha and G. Oram Ring, Philadelphia. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. Patrick Somers Smyth, Boston, aged fifty-two years, died in October of rheumatic heart disease.

Dr. J. G. Dorsey of Wichita, Kansas, aged sixty-nine years, died on November fifteenth of pneumonia. A short obituary, with portrait, will be found on page 66 of this issue.

Dr. Ralph de Lecaire Foster, San Diego, California, aged fifty-four years, died October fifth, of agranulocytosis.

Dr. John H. James, Mankato, Minnesota, aged eighty-three years, died September nineteenth, of coronary thrombosis and arteriosclerosis.

The death of Dr. David De Beck of Seattle is mentioned under Obituaries on page 67 of this issue.

Professor Otto Kuffler, editor of the "Zentralblatt fur die gesamte Ophthalmologie" died recently.

Sir Seymour J. Sharkey, an original member of the Ophthalmological Society of the United Kingdom, died September seventh in his eighty-second year. He succeeded John Abercrombie as secretary of that society, and from a later date until his death he held office as a trustee of the society.

Miscellaneous

A letter from M. S. Mayou of the British Journal of Ophthalmology calls attention to the fact that a number of bacteriologists in Great Britain, using in part material obtained from the Rockefeller Institute, have been unable to confirm Noguchi's work with regard to the relationship of bacterium granulosis to trachoma.

The next International Ophthalmological Congress will be held in Madrid, Spain, in April, 1933. Professor Lundsgaard of Copenhagen is the new president of the International Council, and Professors Van der Hoeve (Holland) and Pflüger (Switzerland) are the new vice-presidents. It was decided by lot that the places of Axenfeld, Byers, Ovio, and Meller on the Council should be taken by Oguchi, Wagenmann, Roselli, and Wright. Dr. Walter R. Parker succeeds Dr. George E. de Schweinitz, who has resigned.

The seventh annual postgraduate course in ophthalmology, all in English, will be given in Vienna between October 1 and December 5, 1930, under the auspices of the American Medical Association of Vienna, at the first and second eye clinics of the Allgemeine Krankenhaus. The usual courses will be given, including operations, by Meller; bacteriology, refraction, and trachoma, by Lindner; physiology and industrial ophthalmology, by Lauber; histology and histopathology, anatomy of fundus diseases, examination, and history of ophthalmology, by A. Fuchs; neurology of the eye, ocular muscles, and field of vision, by Bachstez; orbital anatomy, ophthalmoscopy, operations, and photography of the fundus, by Guist; external diseases and the slit-lamp, by Pillat, ophthalmoscopy, including red-free light, by Safar; and various special subjects. Hofrat Ernst Fuchs will give several special lectures. The course is given for a minimum of ten and a maximum of sixteen entrants. The fee is $250 per entrant. Applications with certified check for $50 should be sent to Professor A. Fuchs, Vienna, VIII., Skodagasse 13. Applications are accepted in the order of their receipt. Further information may be obtained from Professor A. Fuchs; or from the American Medical Association of Vienna, Vienna VIII., Alserstrasse 9, Café Edison.

The following letter has been received from Mr. Leslie Paton of London: "I agree, to a certain extent, with the criticism of the professor of the western medical college which you published in the November number of the American Journal of Ophthalmology. Many of the speakers in the International Congress were difficult to hear because they addressed their remarks to their manuscript rather than to their audience, but I think that the latter part of his criticism is quite unjustified. Very full abstracts of the papers to be read were printed before the Congress, in English, French, German, Italian and Spanish, and the full papers were also printed in the case of the discussions. Such a procedure naturally added greatly to the expense of the Congress, and, as treasurer of the International Council, I feel that it will be necessary to consider whether, at any future congress, we shall be able to do as much in the way of preliminary printing as was done in Holland this year. We must not allow the extraordinary, hard work of the efficient Dutch National Committee to be deprived of the credit that is its due."

Societies

The Colorado Ophthalmological Society is now one of those whose requirements for membership include the certificate of the American Board for Ophthalmic Examinations.

At the November meeting of the ophthalmological and otolaryngological section of the Cleveland Academy of Medicine, Dr. M. Paul Motto was elected chairman, and Dr. A. D. Ruedemann was reelected secretary, for the year 1930.

The eye, ear, nose, and throat section of the Connecticut State Medical Society held its annual fall meeting on November fourteenth, at the Race Brook Country Club in New Haven. An interesting program of un-

usual cases was presented by the members, after which a dinner was served.

The Saint Louis Medical Society was addressed November twelfth by Dr. Ernst Fuchs of Vienna and Dr. Daniel M. Velez of Mexico City.

Dr. Francis H. Adler of Philadelphia addressed the section on ophthalmology of the New York Academy of Medicine, November eighteenth, on "Metabolism of sugar in the eye". Dr. Adler illustrated the lecture with lantern slides.

At the November twenty-first meeting of the section on ophthalmology of the College of Physicians of Philadelphia, Dr. R. D. Redway, of New York, was the guest of honor and read a paper on "The instantaneous color photography of the living human eye and of the fundus".

At the annual meeting of the Sioux Valley Eye and Ear Academy at Omaha, November nineteenth, Dr. William C. Finnoff of Denver presented a paper on "The histopathology of the fundus". Papers were also read by Drs. Charles M. Swab and James F. McDonald of Omaha, respectively, on "The histological background of the ocular syndrome in botulism", and "Recent advances in knowledge of visual pathways".

In addition to those on the regular program at the annual conference of the National Society for the Prevention of Blindness, which met in Saint Louis November eleventh to thirteenth, Professor Ernst Fuchs of Vienna, Dr. Edward Jackson of Denver, and Dr. W. L. Benedict of Rochester took part in the discussions. The Saint Louis University school of medicine arranged a dinner for Professor Fuchs. Drs. Fuchs, Jackson, McReynolds, and Velez (of Mexico) spoke on various topics of general medical interest at the regular meeting of the Faculty Seminar on November fourteenth. On the evening of the fifteenth Professor Fuchs delivered a lecture at the medical school. This was possibly the most comprehensive annual conference ever arranged by the National Society for the Prevention of Blindness.

Personals

Dr. Nelson Miles Black of Milwaukee has moved to Florida, and has opened an office at 703 Huntington building, Miami.

Professor Weve has been called to the chair of ophthalmology in Utrecht, and Dr. E. Marx has been appointed head of the eye clinic in Rotterdam.

The partners of the late Dr. Harold Gifford, whose death was reported in our December issue, and of whom an obituary with portrait will be found on page 64 of this issue, will continue the practice.

Drs. Hompes and Curtis of Lincoln, Nebraska, announced the removal of their office to the Sharp building in that city.

Dr. William F. Moncreiff has been appointed associate clinical professor in the ophthalmological department at Rush Medical College.

Dr. George H. Cross of Chester, Pennsylvania, has been appointed assistant professor of ophthalmology in the University of Pennsylvania graduate school of medicine.

Among public health talks being given under the auspices of the Philadelphia county medical society, Dr. Thomas B. Holloway, on November twenty-sixth, gave a lecture on "Practical points on the care of the eyes."

Dr. William J. Harrison of Philadelphia is about to leave for a year's study abroad. After time spent with Professor Barraquer of Barcelona, Dr. Harrison will visit several other of the well known European clinics.

Dr. A. G. Prangen of the Mayo Clinic, Rochester, Minnesota, visited the Brooklyn Eye and Ear Hospital November thirteenth, as the guest of Dr. P. Chalmers Jameson. Dr. Jameson demonstrated his recession operation with scleral suturing as applied in the correction of squint.

Dr. Adalbert Fuchs of Vienna, in sending the syllabus of the seventh postgraduate course in Vienna, mentions that he is off on a trip to Ceylon, Sumatra, Java, and the Straits Settlements, where he hopes to make special studies in leprosy, the histopathology of which has received his particular attention.

The new Brooklyn Eye and Ear Hospital

(A note by our correspondents, Dr. William B. Ebeling, Brooklyn)

On the eve of the opening of the new Brooklyn Eye and Ear Hospital, which, from the point of view of the number of patients treated, is the largest in the country, it might not be amiss to give a short history of this institution.

Founded in 1868 by a small group of public-spirited citizens, housed in a tiny private dwelling, its sphere of usefulness has extended until it is now treating over a hundred thousand patients a year.

In its long and honorable history, there was opportunity for pioneering. As an example, it may be cited that in 1872 a throat clinic was established. In spite of the fact that the intimate relationship between the long time, yet, so far as can be learned, this throat and ear had been recognized for a hospital was the first eye and ear institution in the world to establish a throat clinic in connection with the other work of the hospital.

On its historical roster are names nationally known, for instance Loring, the inventor of the Loring ophthalmoscope; and Oatman, of the stereoscopic charts.

The hospital was able to seek new and larger quarters thrice only in sixty-one years. The new building will be its fourth home, and is the result of over thirty years of planning and working by successive groups of directors and staff physicians. It is truly not a mushroom growth.

Eight stories in height including the solar-

ium, it has been erected at a total cost of one and a half million dollars on the north side of Greene Avenue, running from Cumberland to Carlton, an area of 200 by 95 feet. It provides 173 beds and 8 operating rooms, besides the largest clinic space in the country. The accompanying illustration will give some idea of its potentialities, and the insets furnish an interesting comparison with the earlier stages of development.

Large photograph is new Brooklyn Eye and Ear Hospital opened January, 1929

While the first duty of the hospital is of course to attend the sick poor, it would be sadly remiss in its larger duties if it neglected the opportunity for educational and research work that its mass of clinical material affords. Hence a research department for special work has been established. Its modern instrumentarium includes the following:

Stereoscope optometer after Pfalz for testing depth perception and for comparative measurement of monocular depth perception; anomaloscope after Nagel for measuring spectral colors for diagnostic purposes; anterior segment camera; Vogt redfree lamp (large); special cataract test lens set; Troncoso gonioscope; Nordenson fundus camera; animal cages; basal metabolism apparatus; respiration rocker; Macbeth illuminometer for measuring light intensities; five galvanometers for ocular muscle study; complete installation for photomicrography; motion picture camera and accessories for studying ocular movements, operative technique, etc.

An equipment such as the new Brooklyn Eye and Ear Hospital provides must surely bear fruit in the future.